Uranium One Americas/Energy Metals Corporation
Meetings with United States Nuclear Regulatory Commissioners
July 21, 2009

- **In order to create and maintain efficient and effective licensing/regulatory processes, the United States Nuclear Regulatory Commission (NRC) should provide the uranium recovery industry with a "predictable" and "consistent" regulatory processes;**

- **Over the past two (2) years, NRC's actions demonstrate that the current licensing/regulatory processes are neither "predictable" nor "consistent" and are resulting in unfortunate consequences to the industry as a result of constantly increasing delays:**

- **Examples of these actions include the following:**

    - **The creation of the Generic Environmental Impact Statement for In Situ Leach Facilities (hereinafter referred to as the "GEIS" or "NUREG-1910") with the promise of site-specific, "tiered" environmental assessments (EAs):**

point by point.

NRC traditionally licensed ISR facilities with an EA in the absence of any site-specific impacts that would result in the need for an EIS. In 2000, the Commission determined that restoration fluids are 11e.(2) byproduct material thereby resulting in ISR processes being classified as "milling underground". Based on this decision, NRC Staff announced to industry at the Uranium Recovery Pre-Licensing Workshop in February of 2007 that all new ISR facility licenses would require an EIS based on 10 CFR Part 51.20(b)(8) (i.e., a site-specific EIS is required for all new "uranium milling" licenses) and not based on the potential safety and health impacts of ISR mining. An EIS generally would involve a two-year licensing review period after a new license application is received by NRC. (In 2008, NRC Staff decided that the two-year review period begins when the license application is "accepted," for detail review, thereby adding at least ninety (90) days to the review process).

Main Messages:

- NRC staff cannot accept money funds for contracting

In order to streamline the process and make efficient use of NRC resources, NRC announced in July, 2007 that they would develop a GEIS (later NUREG-1910) with the stated intention that new ISR facility licensing would be completed with an EA tiered off the GEIS, unless site-specific factors indicated that an EIS would be required. Uranium One supported this process and invested significant financial resources to sponsor the development of the NMA Generic Environmental Report (GER). In June 2007, Uranium One sent a letter authorizing NRC to charge fees for an outside contractor to complete the required National Environmental Policy Act (NEPA) review for its Moore Ranch application. "EMC strongly encourages NRC to begin the contractor selection process now, prior to the submittal of our application". When the Moore Ranch

application was submitted in October, 2007, Uranium One voiced concerns about potential delays in issuing the final GEIS and requested that the licensing action for Moore Ranch not be tiered-off of the GEIS. Uranium One also reiterated the earlier offer to support third party contractor review of the application, recognizing NRC budget and staff constraints.

NRC Staff disregarded the request for a stand-alone EA/EIS for Moore Ranch and the offer to support a third-party review. Staff stated that they were reviewing the Moore Ranch Environmental Report (ER) in parallel with developing the draft GEIS and that the tiered EA would be ready to issue within a few months after the final GEIS is issued, resulting in license issuance in Spring, 2009. NRC Staff later delayed issuing the final GEIS until June, 2009 but still insisted that a license could be issued within the two year target timeframe (i.e., by November 2009). In addition to the GEIS delay, the in depth review of the Moore Ranch ER did not begin until NRC hired a contractor in October, 2008, one full year after submittal. Uranium One was informed that this was due to budgetary constraints in the environmental review branch. The result of this delay was an uncoordinated review of the safety and environmental portions of the Moore Ranch application by NRC Staff. The Uranium Recovery Branch completed their technical review, issued their requests for additional information (RAIs), and received Uranium One's response with an updated Technical Report (TR) before the environmental review even began. Uranium One received separate RAIs on its ER in March 2009, and has submitted responses for some areas, and will file the remaining responses on July 31, 2009. NRC Staff has recognized the inefficiency of this approach and stated at the recent Workshop in Denver that future reviews would be coordinated, resulting in one combined set of RAI's, an approach which Uranium One strongly supports.

NRC Staff informed the industry on May 14, 2009 that a supplemental environmental impact statement (SEIS) tiered-off the GEIS would be required for all new ISR facility licenses, and that this would only result in an additional sixty (60) to ninety (90) days for the review process. Industry was told that this decision was made in response to public comments submitted on the draft GEIS and not based on the significance of the potential environmental impacts of ISR operations. NRC Staff stated that Moore Ranch would be the only application that would not have a license issued within two years of acceptance with an estimated SEIS issuance date of April 2010. However, NRC Staff informed Uranium One that any delay in submitting the ER RAI responses beyond the allotted thirty (30) days would further delay SEIS issuance. This would not have been a critical path item had NRC begun their environmental review in a timely manner and coordinated the review with the Uranium Recovery branch.

Further, NRC Staff informed all current applicants during the aforementioned May 2009 conference call that a notice of intent to prepare an SEIS (NOI) was in preparation by NRC Staff for all new ISR facility license applications under

review and that such NOI would be published in the Federal Register "soon." These notices have still not been published.

- **The release of new NRC policy without industry input that imposes 10 CFR Part 40, Appendix A, Criterion 5B(5) requirements on ISL facility groundwater restoration:**

In the May 19, 2008 RAI for the Moore Ranch TR, NRC Staff requested that Uranium One demonstrate that we could meet the groundwater restoration standards set forth in 10 CFR Part 40, Appendix A, Criterion 5B(5). In discussions concerning the RAI, NRC Staff insisted that the standards in 5B(5) are currently applicable to ISR groundwater restoration based on an (unpublished) legal opinion of the United States Environmental Protection Agency (EPA) and NRC's Office of the General Counsel. Uranium One responded in our RAI response that Criterion 5B(5) was designed to to apply to uranium mill tailings facilities and should not be applied to ISR groundwater restoration as currently written. Uranium One pointed out that, in COMSECY-07-0015, NRC Staff noted that EPA had recently taken the position that the "generally applicable standards" promulgated under 40 CFR Part 192 should apply to groundwater protection at ISR facilities and recommended that NRC "proceed to prepare a rule that will conform to the generally applicable EPA standards in 40 CFR Part 192..." Uranium One was concerned that the requirement to meet Criterion 5B(5)was not possible based on a literal reading of Appendix A and essentially reversed Commission policy and guidance contained in NUREG-1569.

In April, 2009, NRC issued an "informational" RIS (RIS-09-05) (without an opportunity for public comment) that Criterion 5B(5)'s groundwater standards apply directly to ISR facilities. The RIS provided no guidance to industry on how the Criterion's requirements should be applied and stated that the guidance in NUREG-1569 would be updated at some point. The National Mining Association (NMA), with Uranium One as a member, has strongly objected to this RIS and has requested that the Commission direct NRC Staff to rescind it. The RIS cannot be applied using a literal reading of the regulations and staff has provided no guidance.

Additionally, NRC Staff identified compliance with Criterion 5B(5) as an "open" issue for the Moore Ranch Safety Evaluation Report (SER) and has demanded a commitment from Uranium One to meet this standard in the Moore Ranch license application. Uranium One was informed that failure to provide such a commitment would result in a License Condition making such compliance mandatory. Uranium One still believes that NRC Staff has undercut previous Commission policy and the future ISR rulemaking and reversed existing published guidance without providing new guidance and an opportunity for public comment. Under these circumstances, Uranium One cannot commit to meeting 5B(5) in our response to the SER open issues.

- **The release of new NRC policy imposing review and approval requirements for "wellfield packages" on new uranium recovery companies regardless of the technical staff's demonstrable experience and expertise:**

As with the application of Criterion 5B(5) to ISR groundwater restoration, NRC first announced a new "policy" in the Moore Ranch SER RAI in May, 2008. This "new" policy requires that new licensees submit the "first few" wellfield hydrologic packages to NRC Staff for review and approval. This new requirement undercuts the current Commission-endorsed policy on performance-based licensing and the use of performance-based license conditions (PBLCs) and returns to the pre-PBLC days when NRC reviewed (and typically delayed) wellfields before start-up was allowed. The Moore Ranch application provided a detailed description of the data that would be contained in a wellfield package submitted to the Wyoming Department of Environmental Quality-Land Quality Division (WDEQ-LQD) and the Uranium One Safety Environmental Review Panel (SERP) for approval. NRC Staff has stated that this new requirement would be relaxed at some point once it develops comfort with the technical expertise of the new licensee.

Uranium One has resisted this attempt to gut the Commission's policy on performance-based licensing in our response to the RAI. It is our contention that our Moore Ranch application provided extensive detail on the contents of the wellfield hydrologic data packages and the well-understood and utilized SERP process. SERP actions are maintained on site for inspection by NRC, which would presumably occur on a frequent basis for new licensees. Uranium One expressed the concern that limited NRC staff resources would be spread thin by this additional workload, resulting in unnecessary delays in the approval of wellfield packages, as was the case in the past.

Similar to the groundwater restoration standard issue, NRC Staff has identified this as an open issue for the Moore Ranch SER. Uranium One has been told that we must commit to submitting wellfield hydrologic packages for NRC Staff review and approval or this requirement will be included as a License Condition.

It is our position that NRC Staff is unilaterally altering the Commission-endorsed policy of performance-based licensing without consulting either the Commission or the industry. As the first license applicant, Uranium One has expended significant resources to respond to these new "initiatives" with no positive results. Uranium One continues to support the Commission's policy of performance-based licensing and believes that the Commission should act to resolve this issue.

- **The lack of guidance on the use of the ISL Standard Review Plan (NUREG-1569) and other guidance documents (e.g., NUREG-1910) when preparing new ISL facility license applications and lack of guidance on preparing specific exemption requests under 10 CFR Part 40.14(a):**

As noted above, NRC Staff has undercut the guidance contained in NUREG-1569. Uranium One and all other license applicants had been told to rely on this guidance by NRC Staff to prepare technically correct applications. However, industry has been told that NUREG-1569 does not reflect current NRC requirements without the benefit of clarifying guidance.

In addition to jeopardizing the value of NUREG-1569, NRC Staff has recently told one applicant that current Regulatory Guides are outdated and that previously acceptable approaches may no longer be relied upon. In a recent example contained in an RAI, NRC Staff has questioned an applicant's approach for determining the Derived Air Concentration (DAC) for natural uranium and the application of surface contamination release limits. This applicant (as well as Uranium One) applied the guidance contained in Regulatory Guide 8.30, Health Physics Surveys in Uranium Recovery Facilities, which was revised in 2002. This guidance reflects 30 years of experience gained by NRC and industry. NRC Staff stated that the guidance was no longer acceptable and that peer-reviewed technical papers on the solubility of natural uranium published in the Journal of Health Physics could not be relied upon to prepare an acceptable radiological protection program. As with the previously discussed issues, NRC Staff has provided neither supplemental guidance to the industry for their new criteria (nor the technical therefore) and, without such guidance, license application reviews inevitably will be longer than the aforementioned two-year timeframe.

Uranium One expects that similar questions will be identified as "open" issues for the Moore Ranch SER at a teleconference scheduled for July 27, 2009. The Wyoming Mining Association (WMA) is preparing a letter to NRC Staff expressing concern that it is ignoring over 30 years of extensive experience and scientific studies.

In response to the delays in license issuance caused by tiering the existing applications of the GEIS, which was itself delayed from January, 2009 to June, 2009, the current applicants met with the Commission in October and November, 2008. During these meetings, it was suggested that the license applicants consider requesting the ability to construct some site facilities before license issuance using an approach similar to the limited work authorization (LWA) program used for power reactors. This approach was of particular interest to Uranium One since the expected Moore Ranch license issuance date of December, 2009 would occur at the beginning of the winter months in the Powder River Basin when weather would prevent most construction activities. The three applicants prepared a White Paper at considerable expense discussing this approach and

how it might apply to ISR facilities. This approach was presented to NRC Staff in November, 2008. NRC Staff rejected the LWA approach because there are no LWA regulations in Part 40 (note: there are no performance-based licensing provisions in Part 40 but a Part 50.59 model has been used for years in uranium recovery licenses). Staff stated that the industry could consider requesting exemptions to 10 CFR Part 40.32 and promised to issue further guidance.

Staff was directed in SRM-M081211 to budget resources to develop a proposed rulemaking to determine whether a revision to Part 40.32(e) allowing the use of the aforementioned LWA approach was feasible for ISR facilities. At the December, 2008 Staff Briefing, several Commissioners expressed support for the specific exemption process until a rulemaking could be completed.

A draft RIS was not published by Staff until March 27, 2009. The RIS provided no guidance to industry on acceptable preconstruction activities that could be approved under an exemption and stated that NRC did not want to "prejudge" the proposed rulemaking. (This is in direct contrast to the application of Criterion 5B(5) to groundwater restoration at ISR facilities, which certainly prejudges the proposed rulemaking to revise Part 40, Appendix A).

In a letter dated May 6, 2009, NMA and another uranium recovery company submitted comments on the draft RIS and expressed "extreme disappointment" at the length of time NRC Staff took (approximately 4 months) to prepare an RIS that ultimately contained no guidance. NMA noted that the late issuance of the RIS diminishes the usefulness of the RIS in this calendar year to guide applicants in requests for specific exemptions; even in the event it contained useful guidance. Any specific exemption request submitted would almost certainly not be approved until early 2010, when winter conditions at Moore Ranch would prevent any meaningful construction activities.

- **The general lack of industry involvement in NRC policy development:**

In short, Uranium One believes that NRC's ISR regulatory program is undergoing significant changes and will continue to experience such changes in the coming two to three years. Given that NRC typically involves other sections of the fuel cycle in NRC Staff consultations, as well as frequent Commission testimony, Uranium One requests that the Commission investigate possible solutions to these and other issues to enhance NRC's ability to take advantage of over thirty years of proven technical expertise from industry.

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Staff Response to Uranium Recovery Licensing Issues Raised by Uranium One

Background

- In parallel with the review of the new applications, staff has been working on critical infrastructure activities related to uranium recovery licensing, including:
    - The Generic Environmental Impact Statement (GEIS) for In-Situ Recovery (ISR) Applications (Issued June 5 2009)
    - A Regulatory Information Summary on the applicability of Criterion 5B(5) for ISR Restoration (Issued in April 2009)
    - Policy regarding providing wellfield packages in license applications
    - Updating the Standard Review Plan for ISR Facilities (CNWRA)
    - ISL Rulemaking with EPA
    - A Regulatory Information Summary related to allowable pre-construction activities
- Uranium One has expressed the view that the staff's actions related to some of these activities have not been predictable or consistent, resulting in increasing delays

NRC Staff Response – Key Messages

Staff acknowledges that the regulatory program for uranium recovery licensing has, by necessity, evolved somewhat. Reasons for this evolution include:

Prior to 2007, the focus of the uranium recovery program was on decommissioning and on oversight of a few operating facilities. Licensing of new facilities was not considered as likely and attempts to update the infrastructure were low priority, and what was done, was done on a shoe-string budget. When the first applications for new facilities were submitted in 2007, the regulatory infrastructure, including guidance and review plans, was dated.

In the build up of 2008, uncertainty in the number and timing of new applications resulted in the staff taking a measured approach to hiring new staff so as to avoid getting ahead of industry. Moreover, adequate contract resources were not available to address the predicted influx of new license applications until 2009. Because of this gradual ramp- up in staffing and limited available resources, updating the regulatory infrastructure has had to occur in parallel with reviewing the new applications, the first of which was received in December 2007.

Infrastructure updates are needed to correct prior mistakes and update existing guidance to current state-of-the-art practices.

While these infrastructure issues (contracting, staffing, guidance) have necessarily delayed the staff's review of the Moore Ranch application, the staff have worked diligently to reduce these delays to the extent possible through review of the application in parallel with establishing the infrastructure necessary to address the influx of uranium milling applications. Despite these efforts, additional schedule adjustments have been necessary due to an untimely response from the applicant to the staff's request for additional information. Given the delay in the applicant's response and the amount of staff effort needed to address infrastructure issues, the staff view the 4 month delay in the license issuance as minimal.

Staff has taken the following actions to ensure that reviews are completed in a timely way:

- Established intermediate Operations Plan metrics to ensure that we meet the 2 year review commitment (dependent on timely responses from the applicant)
- Used project management software for each new application to track milestones and review progress
- Established regularly scheduled new licensing management meetings to review project status
- Initiated an acquisition strategy for chairman approval to alleviate time constraints in issuing contracts
- Integrated the environmental and safety acceptance and technical reviews and committed to periodic meetings with legal counsel to ensure alignment
- Continued use of the GEIS for in situ recovery license applications to gain efficiencies

- Schedule adjustments for the safety and environmental reviews for new in-situ uranium recovery applications are made based on the timeliness of responses from applicants and contract, budget, and staffing issues.

Responses to Specific Issues Raised by Uranium One

NRC Staff disregarded a request that NRC complete a stand-alone Environmental Assessment (EA) or Environmental Impact Statement (EIS) for More Ranch instead of tiering the review off of the GEIS. NRC staff disregarded Uranium One's offer to provide funds for a third-party review.

- NRC did not have sufficient staffing or contract dollars in place to develop a site-specific environmental impact statement for Moore Ranch when the application was received. Despite this challenge, the staff initiated review of the application in parallel with processing the contract to reduce delays.

- Staff focused initial efforts on developing the GEIS to ensure that NRC would be equipped to review the predicted significant influx of uranium recovery applications. The GEIS will continue to provide efficiencies for future reviews

- NRC staff is not permitted to accept industry funds for federal contracts.

NRC Staff delayed issuing the final GEIS until June, 2009, resulting in further delays to the schedule

- The 6-month delay in the GEIS (from January to June 2009) was due in part to extension of the scoping comment period in response to requests from industry and other stakeholders. NRC also granted a 30 day extension of the comment period on the Draft GEIS in response to stakeholder requests for a 180 day extension. Additional delays were caused by development of a memorandum of understanding with the State of Wyoming as a cooperating agency.

- Nearly 2200 comments were received on the draft GEIS.

- Staff initiated the review in parallel with completion of the GEIS to minimize delays

- The GEIS provides the framework for environmental reviews for site specific ISR applications. As such, the environmental review for the Moore Ranch application is "tiering" from the GEIS and could not be completed until the GEIS was completed., Given the 6 month delay in the GEIS and the necessary connection of the two actions the delay in the environmental review for Moore Ranch is not significant .

The in-depth review of the Moore Ranch ER did not begin until October, 2008, one full year after submittal. The result of this delay was an uncoordinated review of the safety and environmental portions of the Moore Ranch application.

- The staff initiated the review of the application in parallel with placing a contract for the project to reduce delays. These actions were taken despite not having sufficient staffing or contract dollars in place to develop a site-specific environmental impact statement for Moore Ranch when the application was received.

The decisions to prepare supplemental environmental impact statements (SIESs) tiered off of the GEIS instead of EAs and to issue EISs for ISR facilities were made in response to public comment and not based on the significance of the potential environmental impacts of ISR operations.

- The development of the final GEIS was a process that involved both consideration of public comments and staff consideration of the attributes of the final GEIS. Changes are contemplated and made throughout this process. NEPA's emphasis on public involvement may result in schedule adjustments such those that occurred through extension of the date of publication of the GEIS and extension of review schedules to complete supplemental environmental impact statements. Here, both public comments and the fact that the GEIS itself determined that certain impacts had to be evaluated on a site specific basis meshed in reaching the conclusion that an SEIS rather than an EA was the appropriate closeout environmental document for new ISL applications.

- The change in strategy has not had a significant schedule impact. All but one review (Moore Ranch) will be completed within the two-year review time originally indicated to industry.

- The change in strategy provides additional stability to scheduling because it eliminates the possibility of needing to prepare an EIS after an EA.

- NRC staff communicated the change in NEPA strategy to the industry, states, and tribes in a timely fashion through a series of phone calls held May 14 through 22 2009.

The release of new NRC policy without industry input that imposes 10 CFR Part 40, Appendix A, Criterion 5B(5) requirements on ISL facility groundwater restoration:

- The NRC staff is required to implement EPA standards for uranium recovery. EPA has stated that the generally applicable standards for groundwater restoration at ISRs are the standards in the EPA regulations implementing UMTRCA, i.e., 40 CFR 192. 10 CFR 40, Appendix A, Criterion 5B(5) conforms to the groundwater standards in 40 CFR 192. Based on EPA's requirement and NRC's legal interpretation that Criterion 5B5 applies to ISRs, the NRC staff developed RIS-09-05.

- EPA discussed their interpretation of ISR groundwater standards with industry at the NMA/NRC 2008 Uranium Recovery Workshop (ML081430418). On slide 8 of this presentation they stated the following:

  40 CFR 192 regulations implementing UMTRCA for environmental and radiation protection at uranium mills and uranium extraction facilities, adopted by NRC in 10 CFR Part 40 Under UMTRCA (and RCRA), restoration of groundwater must be to

  (1) background; or
  (2) Maximum Concentration Limits (MCL's) for particular constituents, whichever is higher; or
  (3) Alternate Concentration Limits (ACLs), if established

- Before issuing the RIS, NRC and EPA staff discussed this with the NMA in a public meeting on March 15, 2007, in context to the ISL rulemaking. NMA at the time was pleased that the NRC would codify their ability to use ACLs.

- Staff also discussed the applicability of these criteria individually with licensees and applicants, including Uranium One.

The release of new NRC policy imposing review and approval requirements for "wellfield" packages" on new uranium recovery companies regardless of the technical staff's demonstrable experience and expertise:

- The staff strongly supports performance-based licensing for ISR facilities.

- Nonetheless, it has been 20 years since the NRC staff received applications for new ISR facilities and many companies lack a proven track record.

- Given that groundwater is the most important safety and environmental issue at these facilities and groundwater characteristics are site-specific, it is incumbent on the staff to ensure that ISR facilities are safe and groundwater resources are protected.. For these new facilities, the approach to accomplish this is to review wellfield packages.

- The review of wellfield packages is not a new policy. Precedent exists for requesting review and approval wellfield aquifer characterization for unique aquifer conditions. For example, in license condition 10.1.10 in current license SUA-1548 Amendment #14 for Power Resources, Inc. which states:

> "The licensee is prohibited from conducting well-field installation in the southwestern part of the State of Wyoming permit area, T35N R74W, excluding Section 2, until aquifer characteristics have been tested, **reviewed, and approved by NRC.**"

- The new sites have unique complex technical issues which have not been encountered in prior licensed operations including missing confining layers and faults within the ore zone which may connect it to drinking water aquifers and unsaturated aquifer ore zone conditions which limit production rates thus impacting ground water monitoring and excursion capture. Further, applications state in many sections that aquifer characteristics, flow behavior and monitoring in these unique site conditions are not yet understood and will be established in wellfield packages.

- Given the importance of safety with these monitoring programs and the lack of a track record of new applicants, the staff believes that it is prudent to review at least the first wellfield. Once the staff has confidence in the licensee performance, wellfield packages may become more performance based.

The lack of guidance on the use of the ISL Standard Review Plan (NUREG-1569) and other guidance documents (e.g., NUREG-1910) when preparing new ISL facility license applications and lack of guidance on preparing specific exemption requests under 10 CFR Part 40.14(a):

- It has been 20 years since the NRC staff received new applications for new ISR facilities. NRC staff does have an SRP for preparing ISR applications – NUREG-1569. However, staff has found that emerging issues have come up and revisions are necessary. Resources were not available to revise uranium recovery guidance prior to the wave of new applications.

- NRC staff is in the process of revising multiple regulatory guides and NUREG-1569 (Center task order). In addition, staff is in the planning stages of consolidating all uranium recovery guidance into a single reference document. Given the limited staffing in the UR program, revisions to guidance must be done in parallel with license reviews.

- Draft Regulatory Issue Summary (RIS) 2009-XX,"Pre-Licensing Construction Activities at Proposed Uranium Recovery Facilities," was published for public comment in the Federal Register on March 27, 2009. The draft RIS did not contain specific guidance on preparing exemption requests, under the provisions of 10 CFR Part 40.14(a), from the requirements of

Part 40.32(e). Staff is revising the RIS in response to industry's comments and comments from other stakeholders.

- Although Regulatory Guide 8.30 was last revised in 2002, it does not provide a technical basis for the inhalation class for materials manufactured by in situ recovery operators and does not address the potential for radium contamination due to in situ recovery operations. Without this technical basis, or one provided by the applicant, NRC staff can not conclude that the applicant's proposed operations will be protective of the health and safety of their employees. Staff is in the process of developing a RIS to address the deficiencies of RG 8.30.

The general lack of industry involvement in NRC policy development:

- The NRC staff has actively involved industry with decisions regarding ISR regulations and guidance on numerous occasions over the last few years since the resurgence in uranium. For example, the draft RIS entitled, "Pre-Licensing Construction Activities at Proposed Uranium Recovery Facilities." went out for public comment on March 27, 2009, a December 2008 workshop was held in Denver, CO to discuss issues related to licensing and satellite facilities, the staff co-host's the annual NMA/NRC Uranium Recovery workshop, the staff worked with industry on the GEIS scoping, in the March 15, 2007 meeting discussed with industry the ISL rule and groundwater standards at ISR facilities, and held a Pre-licensing Workshop held by NRC staff in February 2007.

Background Information

Health Physics Issues – Reg Guide 8.30

Derived Air Concentration (DAC) for natural uranium:

- Although Regulatory Guide 8.30 was last revised in 2002, it does not provide a technical basis for the inhalation class for materials manufactured by in situ recovery operators. Without this technical basis, or one provided by the applicant, NRC staff can not conclude that the applicant's proposed operations will be protective of the health and safety of their employees.
- Staff is in the process of developing a RIS to address the deficiencies of RG 8.30.

Surface contamination release limits:

- Regulatory Guide 8.30 does not address the potential for radium contamination due to in situ recovery operations.
- Radium has substantially lower contamination limits than natural uranium.
- Staff is in the process of developing a RIS to address the deficiencies of RG 8.30.

HP Background

Derived Air Concentration (DAC) for natural uranium:

- Regulatory Guide 8.30 does not incorporate current regulatory bases for determining internal dose. It retains the ICRP-2 methodology of classifying chemical compounds as either soluble or insoluble while the current ICRP-26,30 methodology (codified in 1991 in 10 CFR 20) utilizes three translocations classes: D, W and Y depending on its retention time in the lung and is dependent on the specific chemical form of a radionuclide.
- The majority of milling experience to date, from an operating and academic standpoint, is with conventional techniques utilizing ammonium diuranate and drying to U_3O_8 end product. Current licensees and applicants utilize in situ techniques that result in an end product of uranyl peroxide and UO_3 in varying degrees depending on drying temperature and time.
- Uranyl peroxide is not addressed in NRC regulations or guidance. Licensees and applicants have mistakenly correlated the old "soluble" terminology with the new inhalation Class "D".
- It is a simple matter to assume Class "W" for dose calculations for licensing purposes. Later, the licensee can perform site-specific tests on the uranium in their plant (using standard testing procedures) to derive a classification for their product/contamination.
- Aside from the DAC issue, licensees and applicants have demonstrated a thorough lack of basic understanding of NRC regulations and associated technical aspects of airborne sampling for radionuclides. As an example, applicants propose using gross alpha surveys on air samples without having fully characterized their operations. This technique will not allow for the identification of specific isotopes. If thorium exists in the plant, it has a regulatory limit that is 100 times lower than natural uranium.

Surface contamination release limits:

- Licensees and applicants recognize the presence of radium in their process (groundwater). Radium has substantially lower contamination limits than natural uranium(20 for radium Vs. 1000 for uranium).
- Regulatory Guide 8.30 is silent with respect to radium.
- Licensees and applicants have not proposed to fully characterize their operations in terms of contaminants.
- Licensees and applicants have not demonstrated compliance with 10 CFR 20.1501. Specifically, they haven't proposed surveys to fully evaluate potential radiological hazards associated with radium including contamination surveys.