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U.S. Nuclear Regulatory Commission
Mail Stop TWB-05-B01
Washington, D.C.20555-0001

RE: Comments on Moore Ranch SEIS, NUREG-1910, Supplement 1; Docket ID NRC 2009-0364

Sent via email to: MooreRanchISRSEIS@nrc.gov

Dear Mr. Lesar:

I am writing on behalf of the Wyoming Outdoor Council to submit comments on the U.S. Nuclear Regulatory Commission's ("NRC's") supplemental environmental impact statement ("SEIS") to the Generic Environmental Impact Statement for *in situ recovery* ("ISR") uranium mining, NUREG-1910, Supplement 1, for the proposed Moore Ranch ISR project. Thank you for this opportunity to submit comments.

Since 1967 the Wyoming Outdoor Council has worked to protect Wyoming's environment and quality of life for future generations. We envision a Wyoming thriving with abundant wildlife, healthy landscapes, clean air and water, strong communities, and sustained by renewable energy.

These comments are submitted on behalf of the Wyoming Outdoor Council and on behalf of our members who live, work, and/or recreate in areas impacted by the Moore Ranch ISR project.

I. Introduction

On July 24, 2007, the U.S. Nuclear Regulatory Commission published a Notice of Intent to publish a Generic Environmental Impact Statement for Uranium Milling Facilities in the Federal Register. 72 Fed. Reg. 40,344 (July 24, 2007). The purpose of the GEIS is to assess the potential impacts of ISL milling in the "western United States" as well as the impacts of alternative methods of uranium recovery, including conventional milling. This was to be done in a generic (i. e. non-site-specific) fashion.

The NRC later issued a notice of availability of a series of supplements to the GEIS,

SUNSI Review Complete
Template = ADM-013

E-RIDS = ADM-03
Add = B. Shroff (BRS)

including the Moore Ranch supplement, in December of 2009. *Notice of Availability of Draft Environmental Impact Statement for the Moore Ranch In-Situ Recovery (ISR) Project in Campbell County, WY; Supplement to the Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities*, 74 Fed. Reg. 65,804 (Dec. 11, 2009). The following comments address the Moore Ranch site specifically, as well as the GEIS, where relevant to the Moore Ranch project site.

II. Alternatives Analysis is Inadequate

A. The Purpose and Need Statement Is Too Limited.

An agency's analysis of alternatives to a proposed project must present a range of alternatives and that range must be reasonable. This is a core principle of the National Environmental Policy Act (NEPA). An agency must not unreasonably limit the scope of alternatives considered. The statement of purpose and need contained in the GEIS is too limited. The result has been that for the Moore Ranch supplement, a reasonable range of alternatives has not been identified.

The GEIS's statement of purpose and need provides:

> Commercial uranium recovery companies have approached NRC with plans to submit as many as 15 license applications for new uranium recovery facilities, as well as up to 9 applications for the restart or expansion of existing facilities in the next several years. The majority of these potential applications (perhaps 18 of the 24) would involve use of the ISL process. The companies have indicated that these new, restarted, and expanded ISL facilities would be located in Wyoming, South Dakota, Nebraska and New Mexico.
>
> NRC is the regulatory authority responsible for issuing a source material license for ISL facilities in those four states. 10 CFR Part 51 regulations require evaluating the environmental impacts of the ISL facility as part of the licensing process. Recognizing that the technology for ISL uranium milling is relatively standardized, that the applications may be submitted over a relatively short period of time, and that the potential ISL facilities would be located in relatively discrete regions of the western United States, NRC decided to prepare a GEIS to avoid unnecessary duplicative efforts and to identify environmental issues of concern to focus on in site-specific environmental reviews. In this way, NRC could increase the efficiency and consistency in its site-specific environmental review of license applications for ISL facilities and so provide an option for applicants to use and licensees to continue to use the ISL process for uranium recovery.
>
> .....
>
> NRC has concluded that it is not appropriate to determine the purpose and need for a site-specific license application in the GEIS.

GEIS at 1-5, citations omitted.

In the Moore Ranch supplement, the NRC has defined the scope of the project's purpose and need as "to provide an option that allows for the applicant to use ISR technology to recover uranium and produce yellowcake at Moore Ranch." *Draft EIS for Lost Creek ISR Project*, NUREG 1910, Supp. 1 ("*SEIS*") § 1.3 at 1-1. The problem with this approach is that it does not allow for a site-specific analysis of whether there is a purpose and need for this particular project. The company, Energy Metals Corporation (a wholly owned subsidiary of Uranium One, Inc.) has not been required to identify a customer for its product. It is merely assumed that such a customer will exist to buy the uranium when the uranium is produced from the site. But this does not satisfy the "hard look" requirement of NEPA to determine if there is indeed a need for this project. With the many uranium projects apparently set to be developed in the next few years, as identified by the NRC in the GEIS, it is questionable whether there will be customers for the uranium developed from this particular Moore Ranch site, without more information. A more thorough economic analysis is required.

The NRC has eliminated a range of reasonable alternatives that should be considered. Such a limited alternatives analysis violates both the letter and spirit of NEPA. The NRC should re-evaluate the alternatives analyses in both the GEIS and the Moore Ranch SEIS. For instance, the SEIS eliminates conventional mining from consideration as an alternative, with the rationale being that conventional mining poses greater environmental impacts than ISR mining. But this is what the SEIS should be used for, to discuss the various impacts from different alternatives. It is not clear to us, at least, that conventional mining, if good top soil preservation and appropriate reclamation techniques are used, would not be better, from an environmental perspective, than ISR mining. Considering that the Moore Ranch site was at one time evaluated for open pit mining -- the Sand Rock Mill Project -- this alternative could have been considered and is presumably a reasonable alternative to consider.

The NRC's stated Purpose and Need, *SEIS* at xiii and xiv, does not satisfy the fundamental requirements of the National Environmental Policy Act. The Congressional purpose of the NEPA is, *inter alia*, "to promote efforts which will prevent or eliminate damage to the environment and biosphere...." 42 U.S.C. §4321. Instead, the NRC states that its sole consideration and federal action is "to provide an option that allows the applicant to use the ISR technology to recover uranium and produce yellowcake at Moore Ranch" and that the NRC's federal action is "the decision whether to issue the license to Uranium One." *SEIS* at xiii, lines 38 - 43. The SEIS is deficient in this regard because the agency has not balanced the need for this project in this location against the potential impacts on the human and natural environment. 42 U.S.C. §4332(C). Thus, when the NRC considers Alternatives, as NEPA requires, the initial defective Purpose and Need causes the agency to fail to consider any meaningful alternatives other than approval or rejection of the application. *SEIS* at xv.

The NRC states that it does not have any "role in the company's business decision to submit a license application." *SEIS* 1.3 at p 1-1. But it does have a role. Whether there is a purpose and need for this project cannot be determined without the NRC evaluating

whether or not this project is economically viable, at this site, for this product. An economic analysis is required.

B. The Alternatives Analysis is not Adequate.

The NRC eliminated from consideration the alternatives of conventional mining and milling, conventional mining and heap leaching, using alternative lixiviants, an alternate site location within Moore Ranch, and alternative methods of waste disposal. *SEIS* § 2.2 at 2-24 to 2-28.

While NEPA does not require the NRC to consider every possible alternative to the proposed action, it does require that the NRC consider all reasonable alternatives. The NRC fails to do this in its Moore Ranch SEIS. For example, the NRC does not consider requiring an alternative site for the facility or extensive additional testing requirements that would conclusively demonstrate that the zone in which uranium will be mobilized for liquid extraction cannot infiltrate the crucial surface aquifer that is part of a very large surface aquifer system that provides potential drinking water and water for livestock. Similar considerations exist for the lack of characterization of surface water flows at the site.

The NRC did not, for instance, consider the alternative of altering the proposed project's boundaries in order to reduce its environmental impacts. The NRC could have proposed eliminating Wellfield #2 from consideration as part of the Moore Ranch Project, in order to protect surface waters on the northeastern portion of the project area. *See*, SEIS, § 3.5.1 and Fig. 3.8 at 3-13. Also, the NRC could have considered eliminating all or part of Wellfield #2 from licensing consideration in order to mitigate impacts to water quality in the 68 Sand aquifer. There is a hydraulic connection between the target 70 Sand aquifer and the higher quality 68 Sand aquifer. SEIS at p. 3-22 – 3-23. Protecting the 68 Sand Aquifer more effectively through such an alternative should have been considered.

III. The Water Resources Impact Analyses is not Adequate

A. Will the Mineral Zone Be Confined?

In the GEIS at 2-1 it states that "Hydrologic (formation) geometry must prevent uranium-bearing fluids (i.e., lixiviant) from vertically migrating… This isolates the uranium-producing horizon from overlying and underlying aquifers." Even the National Mining Association, in its comments on ISL GEIS, § 1.B.1 at 7 states that "The confining strata assist ISR operators' control of recovery solutions by limiting their movement to radial or lateral flow paths." So: industry and the NRC agree, uranium should only be mined in an ISR fashion where it is found within a confining aquifer.

But the NRC now seeks to adopt a new approach to analyzing impacts from ISL operations that would allow mining or uranium in an unconfined aquifer at the Lost Creek site. This is a significant departure from past practice.

For instance, the analysis in the SEIS apparently accepts that excursions from the 70 Sand to the underlying 68 Sand will affect the groundwater quality in the 68 Sand. This is very troubling but, rather than meaningfully analyzing this problematic fact, the NRC simply states that the 68 Sand "will be included in the production zone in the area where the 68 and 70 sands coalesce." SEIS at 4-31.

This departure is quite serious. But beyond that, and more generally, there does not appear to be adequate measures identified for excursions of uranium and lixiviant from the mineral zone, which are quite likely to occur given the geologic nature of the 68 Sand and the 70 Sand, that is present in the Moore Ranch site.

Given the NRC's past position on this question, it seems incongruous to see this statement in the SEIS:

> ISR activities could potentially impact aquifers at varying depths (separated by aquitards) above and below the uranium bearing aquifer as well as adjacent surrounding aquifers in the vicinity of the uranium-bearing aquifer. Surface and near-surface activities that can introduce contaminants into soils are more likely to impact shallow aquifers while ISR operations and aquifer restoration will likely impact the deeper uranium-bearing aquifer, and potentially impact any aquifers above and below and adjacent surrounding aquifers.
> *SEIS* 4.5.2 at p. 4-23

Yet the impacts to groundwater resources are identified as "small." (In fact, almost all impacts from the project are identified as small.) This would seem odd given the significant potential to impact shallow aquifers near the production zone -- since a 3.2 km radius hydraulic drawdown is described as necessary to prevent excursions of uranium ore and lixiviant beyond the mineral ore zone. The only way to control excursions would be to over-produce the groundwater aquifers, perhaps to a greater extent than the 3.2 km radius predicted, to create a drawdown that would depress the water table and thereby keep polluted groundwater from migrating outward. It may require miles and miles of drawdown, in all likelihood. Without such a precaution, the impacts to surrounding groundwater resources will likely be substantial. (This problem is exacerbated by the presence of old drill holes that are abandoned but not properly cased and/or plugged. See additional discussion below.)

B. Groundwater Restoration.

The GEIS and the Moore Ranch SEIS, conclude that groundwater and surface water impacts will be small. There is an assumptions that groundwater restoration will be successful and that groundwater contaminated with radioactive elements and heavy metals will be contained within the production zone during operations and after restoration. But these assumptions, given the available data, are not valid.

Given the history of production, reclamation, and decommissioning activities at

uranium in situ recovery operation sites, any assurances that impacts from spills and leaks will be small or moderate should be viewed skeptically. Groundwater restoration at ISR sites is difficult at best -- even with good geologic and hydrologic conditions at the site.

Even the NRC's own data has demonstrated that ISR site operation restoration efforts that are considered "successful" actually do not restore groundwater to pre-mining conditions. *Consideration of Geochemical Issues in Groundwater Restoration in Uranium In-Situ Leach Mining Facilities*, NUREG CR-6870 (Jan. 2007) at p.19, Table 3; p. 20, Table 4; p. 21, Table 5; p. 22, Table 6. That NRC report indicates that after "restoration" has been deemed complete, contaminant levels may actually rise and migrate due to geochemical conditions. *Id.* at 17, 22, 23.

In short, the data indicate that restoring groundwater to pre-mining conditions may not be achieved. In fact, it may not be, unfortunately, a realistic goal. Therefore, the NRC's conclusion that impacts to groundwater will be small seems incorrect. The NRC should fully evaluate the ability of the uranium ISR industry to restore groundwater and reconsider the impacts to groundwater, both regionally and locally, based on that history.

C. All Wells in the Moore Ranch Project Area Should Plugged and Abandoned

This project site should be examined and assessed for drill holes that have not been properly plugged and abandoned. These holes can become conduits for migrating pollution from the uranium mineral zone and must be addressed before mining can begin. An extensive sweep of the project area should be made with equipment designed to identify such drill holes and a thorough mapping of such holes should be made. Subsequently, each hole that has not been properly abandoned should be properly plugged and abandoned. This should occur <u>before</u> any ISR operations are initiated.

Failure to require Uranium One to perform this very necessary function at the project site will enhance the possibility of excursions of contaminated groundwater out of the mineral zone -- especially to shallower aquifers.

Uranium One may respond that it should not be their responsibility to address the failed reclamation efforts of other companies, whether the drill holes were drilled for ISR operations, or oil and gas operations, or for some other purpose. But this is really beside the point. The operator must take the site as it finds it. Uranium- and/or lixiviant-contaminated groundwater is much more likely to migrate outside of the mineral zone if these wells are not properly plugged and abandoned. It is to the advantage of both the operator and the general public, not to mention the environment, that site integrity be maintained and contamination be minimized. Site integrity must be maintained from the beginning. That will be more likely to occur if the site does not have numerous conduits allowing the escape of contaminated material.

IV. The Cumulative Impacts Analysis is Inadequate

The Council on Environmental Quality ("CEQ") regulations provide:

> Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.
> 40 C.F.R. § 1508.7.

The NRC fails to consider cumulative impacts in a number of respects. The GEIS states that "Due to the complex and site-specific nature of a cumulative impact assessment, this chapter provides useful information for understanding the potential for cumulative impacts when licensing future ISL facilities in the milling regions, but does not make any conclusions regarding cumulative impacts that could be applied to specific sites." GEIS at 5-1. Instead, the NRC defers cumulative impact consideration for site specific *SEIS*s. *Id.* The GEIS does not, therefore, take the "hard look" at cumulative environmental impacts required by NEPA.

But the SEIS in its discussion of cumulative impacts seems to be more of a list of development activities, rather than a careful assessment of what the impacts will be. The *SEIS* does not evaluate the cumulative impacts from non-Federal projects. The SEIS does not look at the cumulative impacts of the Moore Ranch project combined with the impacts of past contamination from uranium mining and milling. The NRC determined, in fact, that contamination from past uranium mining and milling was beyond the GEIS's scope. GEIS § 1.5.4 at 1-14. The GEIS further provides, "[e]valuating the potential impacts from past mining activities on new ISL proposals is a site-specific analysis that, if applicable to a proposed site, would be evaluated by applicants during the site characterization and by the NRC staff when a site-specific licensing review is conducted." *Id.*, § 5.2.1 at 5-3. Why then was this not done in the SEIS?

While the *SEIS* does provide a list of the past, current and reasonably foreseeable future uranium recovery projects in the region, it does not address impacts from those projects. *SEIS*, Table 5-1 at p. 5-2 - 5-3. The *SEIS* provides no quantification or analysis of the cumulative impacts of the past, present and reasonably foreseeable uranium exploitation projects combined with the Moore Ranch project. Cumulative impacts analysis could reveal significant environmental and public health threats. The *SEIS* does not disclose or evaluate how contamination from past mining or milling sites may impact resources, particularly groundwater resources, when combined with the proposed Moore Ranch project. Nor does the *SEIS* disclose how close other past, present and future uranium extraction projects are to the Moore Ranch project, or whether those projects are upstream or downstream from Moore Ranch.

V. Conclusion

The GEIS and the Moore Ranch *SEIS* are inadequate for the purposes of NEPA and are in need of revision. The NRC should withdraw the Moore Ranch *SEIS*, begin a scoping process for the Moore Ranch environmental impact statement (which did not

occur in the past), and then re-issue an *SEIS* for public comment.

Thank you for the opportunity to comment on the Moore Ranch *SEIS* and please do not hesitate to contact me if you have any questions or concerns.

Sincerely,

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