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Ref: EPR-N

Drew Persinko, Deputy Director
U.S. Nuclear Regulatory Commission
Environmental Protection and Performance Assessment Directorate
Division of Waste Management and Environmental Protection
Office of Federal and State Materials and Environmental Management Programs
Mail Stop TWB-05-B01
Washington, D.C. 20555-0001

Re: NUREG – 1910, Supplement 2
Environmental Impact Statement, Final Report
Nichols Ranch and Hank Unit ISR Project,
Campbell and Johnson Counties, Wyoming
CEQ# 20110023

Dear Mr. Persinko:

The U.S. Environmental Protection Agency (EPA) has reviewed the Nuclear Regulatory Commission's (NRC) final Supplemental Environmental Impact Statement (SEIS) for the Nichols Ranch ISR Project. The SEIS considers the environmental impacts that would be connected with NRC's issuance of a license to possess and use source material for uranium milling at the Nichols Ranch ISR Project. Our review and comments are provided pursuant to Section 102(2)(C) of the National Environmental Policy Act (NEPA), 42 U.S.C. Section 4332(2)(c) and Section 309 of the Clean Air Act, 42 U.S.C. Section 7609.

EPA appreciates the willingness that NRC has shown to address our comments on the Nichols Ranch draft SEIS. From our initial meeting in Denver on March 30, 2010 and during subsequent monthly teleconferences, NRC has made efforts to consider EPA's perspective and concerns. Those efforts are reflected in the final SEIS, which provides a more complete analysis of the Nichols Ranch ISR project than the draft SEIS. Comments provided in this letter address key areas of improvement as well as EPA's continuing concerns with the SEIS. We hope this information will be of assistance to NRC as you move forward with this licensing decision and toward completion of future ISR-related SEISs.

One of EPA's primary concerns with the draft SEIS was the inadequate analysis of a range of reasonable wastewater disposal alternatives for the project. In its response to EPA comments, NRC maintains that it is not required to analyze a range of alternatives, and in the Nichols Ranch final SEIS, the alternatives analysis is generally limited to the proposed action and the no action alternatives. As we have discussed, EPA believes NEPA and its implementing

regulations require NRC to use the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon human health and the environment. See 42 U.S.C. § 102(2)(E), 40 C.F.R. §§ 1500.2(e), 1502.14, 1502.16. We do acknowledge NRC's efforts to be responsive to EPA's comments in this regard, including expansion of the range of alternative wastewater disposal options to include methods or technologies not contained within the proposed license application. EPA appreciates the additional information on wastewater disposal alternatives provided in Section 2.2.2 of the final SEIS which discusses the waste disposal options. Table 2-1 compares the options, and Section 4.14.1.2 discusses the potential impacts from implementing the alternative wastewater disposal options. We also were pleased to see in Section 4.5.2.1.2.3 some additional site-specific discussion of the impacts from alternative wastewater disposal options.

However, EPA is concerned that the discussion regarding potential environmental impacts associated with waste management in the final SEIS is focused on the license applicant's proposed action and states that NRC would perform an additional environmental and safety review for a license amendment request for an alternative wastewater disposal option. EPA recommends using the SEIS to perform the environmental and safety review of all reasonably available alternatives for wastewater management. The final SEIS does not contain enough information for a thorough comparative assessment of the management of liquid wastes during recovery operations and aquifer restoration. EPA is aware of NRC's position that it has no authority or regulatory control over an applicant's selection of any particular technology to be used at a site and that if the NRC decides to grant the license request, an applicant must comply with the license, NRC regulatory requirements, and any other applicable, relevant, or appropriate local, State or Federal requirements to operate their facility. However, an agency's regulatory authority or lack thereof should not preclude full disclosure under NEPA of potential constraints and environmental impacts associated with all reasonable alternatives to a proposed action.

The final SEIS discussion of wastewater disposal options acknowledges the potential limitations of the available by-product waste disposal capacity in the local area, yet does not address the potential limitations related to obtaining necessary injection well authorizations. Specifically, the final SEIS does not provide a thorough discussion of the constraints and potential impacts associated with the proposed use of Class I wells to inject wastewaters into the Teckla/Teapot/Parkman formations. NRC concludes that because the issuance of a State permit is necessary in order for the facility to use underground injection as a waste disposal method, the impacts will be small. EPA is concerned about leaving important details out of the discussion of potential impacts to groundwater resources and not fully informing the public and the decision-makers. A Class I disposal well must be sited below the lowermost USDW. At this site, the proposed injection zone is a potential USDW, and there are aquifers below the injection zone that may be USDWs, protected under the Safe Drinking Water Act (SDWA).

For future ISR SEISs, a more thorough discussion of the requirements and limitations of obtaining a Class I injection well permit should be presented, including identification of potential siting constraints related to occurrence and depth of nearby underlying USDWs. In order for the applicant to use a Class I well to inject into the proposed injection zone, the proposed injection zone and all aquifers below it would need to either: (1) be exempted from protection under the

SDWA by a determination that it meets one or more criteria under 40 C.F.R. § 146.4, or (2) fall outside the definition of USDW at 40 C.F.R. § 144.3.It is important to note that EPA has only approved aquifer exemptions for non-injection zones in rare circumstances and has not approved them for sites such as these. The SEIS should acknowledge that approval of an aquifer exemption causes aquifers to lose protection as USDWs under the SDWA. Because Class I injection may not be an available option, a thorough discussion should be presented addressing the alternative of Class V injection, including potential environmental effects and benefits due to water treatment and alternative waste disposal.

There are other examples in the final SEIS's evaluation of alternative wastewater disposal options where key information is not provided which limits the effectiveness of the alternatives analysis. The limitations of the final SEIS's analysis (Section 4.5.2.1.2.3) leave the following important question unanswered:

> Given NRC's acknowledgment in the SEIS of insufficient evaporation rates for the evaporation ponds and land application areas to dispose of all of the process wastewater without at least one other wastewater disposal option or storage capacity, what other disposal options are available or how would additional storage capacity be obtained?

The alternatives analysis for future ISR SEISs should provide a better framework to identify the tradeoffs and finite limits to by-product disposal capacity for all wastewater disposal options. The analysis in the final SEIS suggests that the amounts of by-product 'decommissioning-phase' waste would be greater for the alternative wastewater disposal options and thus, impacts would be larger than for geologic disposal. EPA believes that the total volume of by-product waste for the entire project life cycle could be greater for the geologic disposal option because of the larger liquid volume generated during both the uranium production and aquifer restoration phases compared to the by-product waste sediment left after evaporation that would need licensed off-site disposal. Alternative options other than geologic disposal merely shift waste disposal to the decommissioning phase whereas, injection well disposal is occurring throughout all phases (operations, restoration, and decommissioning).

EPA is pleased to see the detailed air emissions inventory for the construction, operation, and decommissioning phases. The Appendix D analysis for nonroad combustion engine emissions is straightforward and makes use of generally accepted values for source emission factors from reliable published sources. EPA recommends future ISR SEISs provide similar detailed information. If ISR facilities proposed in the future present a substantial increase in emissions or are located closer to more sensitive areas, such as population centers, nonattainment areas, or sensitive Class I or Class II air regions, then a more quantitative approach to modeling direct impacts should be considered in consultation with relevant stakeholders. We also appreciate the discussion of additional factors or uncertainties in the assumptions that could increase the annual emissions estimates. For example, when the applicant did not furnish the NRC with a schedule for drilling the eight deep disposal wells, the analysis presented in Table D.3-4 provides an upper bound on the level of emissions, if all eight deep wells are drilled within the same year by a Tier 0 drilling rig. EPA thinks that it is far more likely that the applicant will bring in the deep well-drilling contractor at one time to drill all eight wells. Since, in that more

likely scenario, the adjusted [combined] annual diesel emissions from all drilling and construction equipment approaches 100 tons per year, we recommend a license condition requiring the applicant to use at least Tier 1 diesel engines as a reasonable mitigation measure to reduce the annual emissions to as low as reasonably achievable.

EPA is involved in early scoping efforts for a regional technical study being conducted by the Bureau of Land Management to help evaluate the potential future cumulative impacts of surface coal mining, coalbed methane, and other energy-related development in the Powder River Basin (PRB). The study consists of multiple tasks including development of a forecast of reasonably foreseeable development (RFD) for steam coal, coalbed methane (CBM), oil and gas, and ISR uranium production in the PRB. In 2010, the second phase of the PRB energy review was initiated to update the RFD projections in line with new forecasts to year 2030. Best available modeling technology will be used to calculate predicted air quality effects. NRC may benefit from cooperating in this regional technical study that covers much of the Wyoming East uranium milling region.

EPA appreciates the opportunity to review the Nichols Ranch final SEIS. We look forward to continued consultation with NRC regarding the uranium recovery program to support our joint national objectives of improving the prevention and mitigation of land and water impacts from the recovery of source materials and the generation of byproduct waste and ensuring the latter's long-term isolation from the human and natural environment. If you have any questions, please contact me at (303) 312-6004 or James Hanley of my staff at (303) 312-6725.

Sincerely,

Larry Svoboda, Director
NEPA Compliance and Review Program

Enclosure: Specific technical comments

CC: Larry Camper, Keith McConnell, Bill von Till, Kevin Hsueh, Patty Swain, Eldon Allison, Kerry Agen, Kristin Yannone, Marthea Rountree

SPECIFIC TECHNICAL COMMENTS
For use in Future ISR SEIS Projects

Requests for additional information or explanations

Table 2-1 on Page 2-20 does not include any information on potential impacts to USDWs from Class I disposal –the Table compares only operational aspects of the alternatives. The Table also does not include any information on the environmental benefits of solar evaporation ponds.

Section 3.5.2.3.1 – page 3-22: What is the basis for using a 0.6 ft/day value for hydraulic conductivity for the F Sand? Aquifer test data for this sand indicate that the hydraulic conductivity ranges from 0.14 to 9.4 ft/day. How does 0.6 ft/day represent the best single point estimate for this aquifer parameter?

Lack of clarity in reworded or paraphrased regulatory language

Page 4-29/Section 4.5.2.1.2.2: We suggest that the following preferred language be used whenever discussing the aquifer exemption process for Class III wells in future ISR SEISs:

In the case of extraction of minerals using injection wells, and pursuant to EPA UIC regulations, an aquifer meeting the definition of underground source of drinking water ("USDW") must be designated as an exempt aquifer within the subsurface area where mineral production will occur. A USDW is defined as an aquifer or its portion which supplies any public water system, or which contains a sufficient quantity of ground water to supply a public water system and currently supplies drinking water for human consumption, or contains fewer than 10,000 mg/l total dissolved solids, and which is not an exempted aquifer.

Pertaining to Class III in-situ leach ("ISL") operations, such a designation must be in compliance with 40 CFR 146.4 and approved by the Administrator. An aquifer or aquifer portion which meets the criteria for a USDW may be determined to be an "exempted aquifer" if it does not currently serve as a source of drinking water and it cannot now and will not in the future serve as a source of drinking water because it is mineral, hydrocarbon or geothermal energy producing, or can be demonstrated by a permit applicant as part of a permit application for a Class III operation to contain minerals that considering their quantity and location are expected to be commercially producible.

Once exempted, the defined aquifer or its portion would no longer be protected as a USDW under the Safe Drinking Water Act ("SDWA"). For example, at the proposed Nichols Ranch Project, portions of the "A Sand" aquifer could potentially be exempted in defined areas related to commercial mineral production operations. The remaining portion of the "A Sand" aquifer, beyond the designated exempted area, would still be considered a USDW and continue to be protected under the SDWA. At the proposed Hank Mining Unit, portions of the "F Sand" aquifer could potentially be exempted in defined areas related to commercial mineral production operations. The remaining portion of the "F Sand" aquifer, beyond the designated exempted area, would still be considered a USDW and continue to be protected under the SDWA.

Page 4-36/Section 4.5.2.1.2.3: We suggest that the following preferred language be used whenever discussing the aquifer exemption process for Class I wells in future ISR SEISs and here we use the site-specific aquifer situation for Nichols Ranch as an illustration:

Up to four Class I wells could be drilled at the proposed Nichols Ranch Project and four Class I wells could be drilled at the proposed Hank Unit for deep disposal of liquid wastes from the in-situ leach (ISL) facilities, depending on the production rates and the capacity of each disposal well. Under federal UIC regulations, Class I injection wells for the disposal of hazardous, radioactive, or other industrial and municipal disposal waste inject fluids beneath the lowermost formation containing a USDW within one quarter mile of the well bore. The State of Wyoming is reviewing a permit application proposing up to eight Class I disposal wells injecting into the Teapot-Teckla-Parkman Formation at an injection depth of 2,326 m to 2,652 m [7,630 to 8,700 ft].

However, Class I injection into the Teapot-Teckla-Parkman Formation may not be feasible at this site because the water quality of two identified sandstone members (Sussex and Shannon which are oil-producing) of the Cody Shale (often called Steele Shale), may be less than 10,000 mg/L TDS. If so, these members could be considered as underlying USDWs, and Class I injection wells must inject <u>below</u> the lowermost USDW.

Should Class I injection not be feasible at this site due to such USDW considerations, Class V injection could be an option. However, wastes from ISL facility operations typically contain radioactive by-product material, and under UIC regulations radioactive waste can only be injected into a Class I well. "Radioactive waste" is defined as "any waste, including byproduct material, which contains radionuclides in concentrations which exceed those listed in 10 CFR part 20, appendix B table II, column 2." Therefore, Class V injection of ISL facility waste likely would require some treatment prior to injection to reduce radioactive waste concentrations to less than those listed in 10 CFR part 20, appendix B table II, column 2.

<u>Mistakes in Responses to Comments</u>

Appendix B-77: Response to comment on how aquifer exemption buffer zones would be monitored and enforced. The NRC has responded that after the exempted zone of the mining unit aquifer is restored, the facility is decommissioned, and the NRC license is terminated, EPA or Wyoming regulates and monitors the exempted zone and has responsibility to ensure that the exempted zone is not used as a source of drinking water.

This is not entirely correct; EPA aquifer exemption rules provide neither authority nor the responsibility to <u>prohibit</u> the exempted portion of a restored aquifer from use as a drinking water source.

Recommendations for impact mitigation measures as enforceable license conditions

EPA suggests that NRC provide some additional explanation of how excursions are monitored and managed in unconfined aquifers and what type of data will be obtained in the required "hydrogeologic test" discussed as a proposed license condition (LC) in Appendix B-Pages 72-73. Based upon our review of draft material license SUA-1597, we expect to see this discussion in Facility-specific Condition 10.9 or as a new license condition developed for uranium recovery in an unconfined aquifer.