



# NEW MEXICO ENVIRONMENTAL LAW CENTER

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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

Dear Mr. Lesar:

On behalf of the Southwest Research and Information Center (“SRIC”), please accept the following comments on U.S. Nuclear Regulatory Commission’s (“NRC’s”) supplemental environmental impact statement (“SEIS”) to the Generic Environmental Impact Statement for *in situ leach* (“ISL”) uranium mining, NUREG-1910 (“GEIS”), for the proposed Moore Ranch ISL project.

## **I. Introduction**

On July 24, 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 purported purpose of the GEIS is to assess the potential “generic” impacts of ISL milling in the “western United States” as well as the impacts of alternative methods of uranium recovery, including conventional milling. *Id.* at 40,444 – 40,345. The Draft GEIS was issued on July 28, 2008. *Notice of Availability of Draft*

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Reg. 43,795 (July 28, 2008). SRIC submitted comments on the scope of the GEIS (SRIC Scoping Comments, Nov. 30, 2007) and the Draft GEIS (SRIC Comments on Draft GEIS, Nov. 7, 2008), and incorporates those comments by reference herein. The NRC issued a notice of availability of a series of supplements to the GEIS, including the Moore Ranch SEIS, in December of 2009. *Notice of Availability of Draft Environmental Impact Statement for the Moore Ranch ISR Project in Campbell County, WY; Supplement to the Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities*, 74 Fed. Reg. 65,806 (Dec. 11, 2009). The following comments are intended to address both shortcomings in the Moore Ranch SEIS and the GEIS.<sup>1</sup>

## **II. Alternatives Analysis is Inadequate**

### **A. The Purpose and Need Statement Unreasonably Limits Alternatives Considered.**

An agency's analysis of alternatives to the proposed project is at the heart of NEPA, and as such, the alternatives considered must be reasonable. An agency may not unreasonably limit the scope of alternatives considered, by unreasonably narrowing the agency's stated objective. The statement of purpose and need in the GEIS is so limiting that any subsequent statement of purpose and need in a supplemental EIS, in this case the Moore Ranch SEIS, will inevitably be too narrow to allow for consideration of a reasonable range of alternatives.

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

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<sup>1</sup> Additional comments on the GEIS are appropriate in this case because prior to its application to the Moore Ranch, Nichols Ranch, and Lost Creek projects, the GEIS was a purely theoretical and abstract document. The GEIS did not apply to any Federal plan or project and did not represent any final NRC regulatory or policy decision. The GEIS did not establish any specific rights or obligations and the NRC did not issue a record of decision on the GEIS. Thus, it was impossible for SRIC or any other member of the public to meaningfully comment on the GEIS in a concrete context.

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.

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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.

While purporting to defer any determination for site-specific purposes and needs, the GEIS in reality frames the purpose and need for subsequent supplemental EISs. The GEIS frames its purpose and need in unreasonably narrow terms, limiting the alternatives that the NRC will consider in the context of its stated objective, i.e., licensing ISL uranium operations. The statement of purpose and need in the GEIS serves to narrow the alternatives the NRC will consider to either 1) granting an ISL operation license application as proposed or 2) no action. Indeed, the NRC Staff has interpreted the GEIS's statement of purpose and need in exactly these terms. See, <http://www.nrc.gov/materials/uranium-recovery/geis/alternative-eval.html>. A copy of that webpage is attached hereto as Attachment A. Moreover, in reality, limiting the purpose and need scope to these two alternatives, effectively means that only one alternative – licensing

an ISL operation – is given serious consideration, since the NRC has **never** denied a materials license application in its institutional history.

As would be expected given the GEIS’s narrow purpose and need scope, the NRC has defined the Moore Ranch project purpose and need unreasonably narrowly. In the Moore Ranch SEIS, 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.” SEIS at § 1.3, p. 1-1.

On its face, this statement of purpose and need unreasonably truncates the universe of alternatives the NRC can consider by forcing the federal action into three pigeonholes: 1) uranium recovery; 2) using ISL technology; 3) at the Moore Ranch site. The NRC is therefore limiting the alternatives it will consider in the Moore Ranch SEIS, as it did in the GEIS, to either licensing the proposed project or not licensing it, i.e. the “no action” alternative. By limiting the scope of the major Federal action, the NRC has eliminated a range of reasonable alternatives that could - and should - be considered<sup>2</sup>. Such a truncated 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.

B. The Alternatives Analysis Itself is Inadequate.

Notwithstanding the fact that the statement of purpose and need unreasonably limits which alternatives the NRC considered, the SEIS’s alternatives analysis itself is inadequate. The NRC limited its alternatives analysis in the SEIS to two analyses: the proposed action, consisting of licensing ISL operations at Moore Ranch (SEIS at § 2.1.1, pp. 2-1 – 2-24) and the “no action”

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<sup>2</sup> If the NRC had articulated a reasonable and legitimate purpose and need, the range of alternatives considered would likewise have been reasonable. For example, if the NRC had articulated a purpose and need of extracting uranium as a fuel for domestic and foreign nuclear power plants as a way to provide electricity, then it, and the public, could have analyzed alternatives such as using renewable resources to meet electricity demand, extracting uranium from more appropriate locations, or whether there was a market need for uranium extraction at all.

alternative (SEIS at § 2.1.2, p. 2-24). The NRC eliminated from consideration the alternatives of conventional mining and milling, heap leaching, using alternative lixivants and alternative methods of waste disposal. SEIS at § 2.2, pp. 2-24 – 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 SEIS. For example, the NRC failed to consider the reasonable 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 mine area. *See*, SEIS, § 3.5.1 and Fig. 3.8<sup>3</sup> at 3-13. Likewise, the NRC could have eliminated all or part of Wellfield #2 from licensing consideration in order to mitigate impacts to water quality in the 68 Sand aquifer, because the SEIS reveals a hydraulic connection between the target 70 Sand aquifer and the better quality 68 Sand aquifer. SEIS at 3-22 – 3-23. By failing to consider these, and potentially other, reasonable alternatives, the NRC has violated NEPA.

### **III. The NRC Fails to Consider Impacts from and on Climate Change**

The NRC determined that the combined effects of climate change and ISL mining would not be considered in the GEIS. GEIS at 1-15. The NRC adopted a similar position in the SEIS, choosing instead to turn a blind eye to the cumulative adverse impacts of the project and climate change because of what NRC characterized as “the imprecise state of the science” on climate change. SEIS at 5-13.

While the exact extent and timing of impacts of climate change may not be certain, many adverse impacts have already been documented and many more are reasonably certain to

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<sup>3</sup> Figure 3.8 is among the many figures throughout the Moore Ranch, Nichols Ranch, and Lost Creek SEISs that are illegible or barely legible. The failure to present legible information within the SEISs violates NEPA and its implementing regulations.

occur in the future as warming continues. *See, e.g., Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act*, 74 FR 66,496 (December 15, 2009). Moreover, as the recent Council on Environmental Quality Memorandum, attached hereto as Attachment B demonstrates, even though the science on climate change is rapidly evolving, federal agencies have an obligation to consider both the greenhouse gas emissions a federal action will contribute to the atmosphere and the impacts a federal action will have on natural resources impacted by climate change. Sutley, Nancy, Chair, Council on Environmental Quality. Memorandum for Heads of Federal Departments and Agencies, *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions* at 1 (Feb. 18, 2010) (“Draft NEPA GHG Guidance”).

Further, as the attached document, SRIC’s Attachment C, demonstrates, the effects of climate change on the region where the Moore Ranch project is proposed can be reasonably anticipated. U.S. Global Change Research Program, *Global Climate Change Impacts in the United States, Regional Climate Impacts: Great Plains* at 123-128 (2009) (“Great Plains Report”); *see also* Draft NEPA GHG Guidance at 8. Attachment C clearly shows that depending on which region of Wyoming the Moore Ranch project is located, climate change will affect the Moore Ranch project’s impacts and these impacts should be analyzed. If the Moore Ranch project is in a region of Wyoming that can expect less snowpack and spring runoff and disruption of precipitation patterns over the next decades, as is expected to occur throughout the West, the NRC should disclose this and evaluate whether potable water sources outside the ore zone should be sacrificed <sup>4</sup>in exchange for extracting the mineral resource. If the Moore Ranch

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<sup>4</sup> The SEIS discloses that the Moore Ranch project has high quality groundwater outside the ore zone. SEIS at 3-19. Assuming the NRC does not allow Energy Metals Corp./Uranium One to “restore” groundwater to alternative concentration limits, it will only be required to restore groundwater to average baseline conditions within the wellfield, i.e., good quality groundwater outside the ore zone will be averaged with poor quality groundwater within

project is in a region of Wyoming that could expect more precipitation over the next decades, the NRC should disclose that fact and evaluate how increased soil saturation, flooding and aquifer recharge would cumulatively interact with the Moore Ranch project's impacts. A "hard look" analysis of the impacts of climate change, combined with the impacts of the Moore Ranch project is critical, given that water is the most important factor affecting activities in the Great Plains region. Great Plains Report at 124; Draft NEPA GHG Guidance at 6-7.

The SEIS also does not fully disclose the impacts the mining operation will have on greenhouse gas emissions. The SEIS mentions how many greenhouse gas emissions the Moore Ranch project is expected to generate in comparison to emissions generated at coal mines. SEIS at 5-14. However, this is an incomplete inventory of the greenhouse gas emissions that will result from the Moore Ranch project. Before the yellowcake from the Moore Ranch project can be used for fuel for a nuclear power plant, it must be converted to uranium hexafluoride, enriched and fabricated. *See, e.g.* World Nuclear Association, <http://www.world-nuclear.org/info/inf03.html>, last visited Feb. 23, 2101. These are indispensable processes if the uranium from the Moore Ranch project will be used for nuclear fuel. These steps are also exceedingly energy intensive and rely on energy from carbon generating sources. Estimates for the carbon emissions generated in the nuclear fuel cycle range from 33 grams CO<sub>2</sub>/kWh to 120 grams CO<sub>2</sub>/kWh, depending on uranium ore grade and other variables. Öko-Institut, *Comparison of Greenhouse Gas Emissions and Abatement Costs of Nuclear and Alternatives Energy Options from a Life-Cycle Perspective* at 4 (2006).<sup>5</sup> Since the uranium produced at the Moore Ranch project would have no utility without being enriched and fabricated into fuel, the

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the ore zone creating an overall poor quality groundwater baseline. Additionally, it is unlikely that Energy Metals Corp./Uranium One will be able to restore groundwater to even those inflated standards, since no ISL operation has ever restored groundwater to pre-mining conditions. *See*, § IV.C., below.

<sup>5</sup> Available at [http://www.oeko.de/publications/reports\\_studies/dok/659.php](http://www.oeko.de/publications/reports_studies/dok/659.php), last visited Feb. 23, 2010.

SEIS should have disclosed these carbon emissions and analyzed their impacts. Draft NEPA GHG Guidance at 2 (“it is appropriate for an agency to quantify and disclose its estimates of the expected annual direct and *indirect* GHG emissions in the environmental documentation for the proposed action.”) (emphasis added).

#### **IV. The NRC’s Water Resources Impact Analyses are Based on Inaccurate and Misleading Data**

##### **A. The NRC Misrepresents the Impacts from Excursions.**

In the Moore Ranch SEIS, the NRC makes an unprecedented analysis of impacts from excursions. Until the Moore Ranch project, the ISL industry and the NRC have taken the position that ISL mining can only occur in confined aquifers. *See, e.g.*, GEIS at 2-1 (“Characteristics of Uranium Deposits that are Amenable to ISL Extraction ... Confining Layers: 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”); National Mining Association, Comments on ISL GEIS, § 1.B.1 at 5 (“Uranium deposits amenable to ISR uranium recovery occur in permeable sand or sandstones that are confined above and below by impermeable strata”), § 1.B.1 at 7 (“The confining strata assist ISR operators’ control of recovery solutions by limiting their movement to radial or lateral flow paths.”). The NRC’s new approach to analyzing impacts from ISL operations in an unconfined aquifer is insufficient in two significant ways.

First, the NRC’s analysis masks how the inevitable excursions from the 70 Sand to the underlying 68 Sand at the Moore Ranch site will affect groundwater quality in the 68 Sand. Indeed, 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. Thus, by fiat, the NRC evades evaluating the impacts on an

underlying, good quality aquifer and the alternatives and mitigation measures that would follow from such an analysis. This is clearly not the “hard look” NEPA requires.

Second, as with the NRC’s analysis of groundwater restoration<sup>6</sup>, the NRC’s analysis of excursions in the context of an ISL operation in an unconfined aquifer highlights the fact that the NRC has no coherent framework for regulating ISL operations. This lack of any coherent and comprehensive regulatory framework results, as it does in the Moore Ranch SEIS, in an arbitrary *ad hoc* analysis, where the public is unable to rely on any objective, consistent standards by which to judge the NRC’s site-specific environmental analyses. This arbitrary *ad hoc* approach which confounds public participation in the NEPA process is not supported by NEPA or its implementing regulations. Moreover, the NRC did not disclose that its analysis of the Moore Ranch project’s excursion impacts on the 68 Sand represents a significant policy and technical shift from prior environmental analyses. The NRC should withdraw the Moore Ranch SEIS and the GEIS and re-issue each after it has promulgated regulations governing ISL operations.

B. The NRC Misrepresents Spill Impacts in the GEIS and SEIS.

In evaluating the Moore Ranch project’s impacts on water resources, the NRC relies heavily on the survey of leaks and spills at ISL operations in the GEIS (§ 2.11.2) and the NRC Staff’s memorandum *Staff Assessment of Groundwater Impacts from Previously Licensed In-Situ Uranium Recovery Facilities*, ML091770187 (July 10, 2009). However, both these documents are incomplete or inaccurate. Moreover, the NRC’s characterization of the data in these documents as used in both the GEIS and the SEIS is misleading. As a result, neither the GEIS, nor the Moore Ranch project supplement to the GEIS are based on accurate data and therefore neither is sufficient under NEPA

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<sup>6</sup> Specifically, see § IV.C.3, below.

The attached data from the nearby Irigaray/Christensen Ranch ISL project show that over the project's operating history, there have been nearly 100 leaks and spills dumping hundreds of thousands of gallons of contaminated water on the site. *See*, SRIC Attachment D. Even as recently as 2003, the Christensen Ranch project recorded a spills over 1000 gallons and in 1999, it recorded a series of spills over three months totaling over 100,000 gallons. *Id.* at Table 1.2, # 81 and #63-68.

The spill history at the Irigaray/Christensen Ranch project is not anomalous. In 1995, a surface estate owner in Texas sued ISL operator Uranium Resources, Inc. ("URI") for damages to his land from a series of spills at URI's Longoria Ranch project. A copy of the complaint in that law suit is attached hereto as Attachment E. There, the plaintiff alleged that URI's operations caused contamination of soils, ecosystems, ground and surface water due to spills and purposeful discharge of radioactive and hazardous contaminants. Attachment E at 3-5. The lawsuit subsequently settled.

The NRC, to a limited extent, acknowledges the poor record of spills and leaks at ISL operations. In the GEIS, the NRC notes that the Smith Ranch-Highland ISL operation , located near the proposed Moore Ranch project, had more than 80 spills from 1988 to 2007. GEIS at 2-44. Some of these spills were as large as 198,500 gallons. *Id.* Indeed, the attached Wyoming Department of Environmental Quality Notice of Violation report (Attachment F) notes that spills, leaks and excursions at Smith Ranch – Highland had become "routine". Attachment F at p. 17.

However, rather than meaningfully evaluating the impacts of spills and leaks on water resources in the GEIS, the NRC simply makes sweeping pronouncements about the potential impacts, largely concluding that they will be small to moderate. *Id.* at 4.3-10 - 4.3-12.

Moreover, the NRC concedes in the GEIS that a meaningful evaluation of impacts from spills and leaks is contingent on site-specific conditions. *See, e.g., Id.* at 4.3-12 (“Hence, potential environmental impacts due to spills and leaks from pipeline networks or failures of well integrity in shallow aquifers would be expected to be SMALL to MODERATE, depending on site-specific conditions.”).

Rather than conducting a site-specific analysis of reasonably foreseeable impacts from spills and leaks at the Moore Ranch project, the NRC simply states that site-specific conditions at the Moore Ranch project are consistent with the description of the affected environment described in the GEIS<sup>7</sup> and concludes that the impacts from spills and leaks on surface waters would be small. *SEIS* at 4-21. This analysis, however, disregards the close proximity of mining operations at Moore Ranch to surface water sources such as Upper Wash #1, Upper Wash #2, Ninemile Creek, and several wetlands. *Id.* at 3-14. As a result, the NRC evades any meaningful analysis of impacts on surface waters by endorsing site-specific analyses in the GEIS, and then simply incorporating the GEIS’s analysis into the Moore Ranch *SEIS*, when presented with the opportunity to engage in a site specific analysis.

The NRC reaches a similar conclusion with respect to the impacts from spills and leaks on groundwater. *Id.* at 4-25 - 4-26. In contrast to the evaluation of impacts from spills and leaks on surface water, the NRC considers some site-specific conditions in analyzing impacts from spills and leaks on groundwater. *Id.* However, the NRC’s conclusion that impacts to groundwater from leaks and spills at the Nichols Ranch project will be small is just as unjustified as its conclusion about impacts on surface water. Again, the NRC’s conclusion that impacts on

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<sup>7</sup> The GEIS describes the **regional**, not local, affected environment which encompasses parts of seven counties within the so-called Wyoming East Milling Region. GEIS, Fig. 3.1-2 at 3.1-3. This general regional description of the affected environment is no substitute for a meaningful description and analysis of the Moore Ranch project’s impacts on the local environment.

groundwater from leaks and spills will be small rests on the assumption that Energy Metals Corp./Uranium One will use effective mitigation measures. *Id.*

As with its conclusions about the impacts from spills and leaks on surface waters, the NRC's conclusions about groundwater impacts completely disregard the operational history of all other ISL operations that have the same leak detection and well integrity programs as proposed for the Moore Ranch project. The Smith Ranch-Highland project is illustrative. As Attachment F demonstrates, one of the largest and oldest uranium ISL projects in Wyoming was found to have a deeply troubling history of leaks, spills and excursions, in addition to disregarding permit requirements. Attachment F, Moxley, Mark, Report of Investigation, Power Resources, Inc. at § 3 (Nov. 21, 2007). This fundamental contradiction between actual operational data and the NRC's conclusions about the magnitude of impacts in both the GEIS and the SEIS is contrary to NEPA.

C. The NRC Misrepresents the Impacts from Groundwater Restoration.

In both the GEIS and the Moore Ranch SEIS, the NRC's conclusion that groundwater impacts will be small to moderate is premised on the assumptions that 1) that groundwater restoration will be successful and that 2) groundwater contaminated with radioactive elements and heavy metals will be contained within the production zone during operations and after restoration. Available data demonstrate that none of these assumptions are reasonable.

As with its analyses of water impacts from spills and leaks, the NRC mischaracterizes ISL mining's groundwater restoration efficacy history and unreasonably minimizes the impacts of groundwater restoration. NRC's failure to reasonably consider the impacts of groundwater restoration in the GEIS and SEIS stems from two fundamental problems – the NRC's practice of averaging poor groundwater quality with good groundwater quality and the NRC's failure to

acknowledge that no ISL operation has ever been able to restore groundwater to pre-mining conditions.

1. *Groundwater Restoration Impact Analyses are Based on Averaging Poor Quality Groundwater with Good Quality Groundwater.*

First, the NRC considers restoration based not on actual pre-mining groundwater quality, but instead ties restoration to the **average** of poor groundwater in the immediate ore zone with good groundwater quality outside the ore zone but within a mine area. The description of the affected environment in the SEIS reflects this bias toward inflating contamination levels. Table 3.3 shows the groundwater quality in the target, overlying and underlying aquifers at the Moore Ranch project. SEIS at 3-23 – 3-24. This table leaves the impression that the aquifers within the proposed mine boundaries exceed EPA and Wyoming water quality standards in several respects. However, because of the practice of averaging good groundwater quality with poor groundwater quality, these results are incomplete and misleading.

Moreover, average groundwater constituent concentrations are virtually meaningless, especially if the sample locations, date of sampling and individual constituent concentrations are not disclosed or unknown. Therefore, instead of disclosing the average constituent concentrations in a particular aquifer, the SEIS should disclose all the groundwater sampling data, including the sample locations, date of sampling, and constituent concentrations. The written lab reports should also be included as part of the record. If those data are not available, the SEIS should disclose that fact.

Further, the practice of averaging good and poor groundwater quality misleads the public. It skews the impact analysis toward minimizing the groundwater impacts of ISL mining in general and the Moore Ranch project in particular. In contrast, if groundwater quality within an ore zone and outside an ore zone (which has better pre-mining water quality) is analyzed

separately and not averaged, the adverse impacts on groundwater outside the ore zone would be substantially larger. By averaging the pre-mining water quality outside and inside the ore zone, the NRC is hiding the real groundwater impacts an ISL operation may have. Neither NEPA nor its implementing regulations contemplate such a result.

2. *The NRC Fails to Disclose that No ISL Operation has Ever Restored Groundwater to Pre-mining Conditions.*

Even though the NRC uses a mathematical artifice that inflates the pre-mining contaminant levels within a project's boundaries to leave the impression that baseline groundwater quality is poor and restoration is possible, the NRC fails to disclose that no ISL operation in the United States has **ever** restored groundwater to pre-mining conditions. The GEIS's brief discussion of ISL restoration history implies that while restoration may be difficult at times, there have been some successful restoration projects. GEIS at 2-51. The GEIS's discussion of the impacts of groundwater restoration is similarly conclusory and misleading. The GEIS's analysis of groundwater impacts from restoration is largely limited to an ISL operation's effects on groundwater quantity, not quality. *Id.* at 4.3-17 – 4.3-19. The GEIS's discussion of potential groundwater quality impacts in the "Wyoming East Milling Region" is limited to a single paragraph and does not mention the invariable failure of ISL operations to restore groundwater to pre-mining conditions. *Id.* at 4.3-18.

The SEIS's analysis of groundwater impacts from restoration is similarly insufficient. The SEIS relies entirely on the GEIS's framework for analyzing groundwater quality impacts. The NRC's site-specific analysis of groundwater impacts at the Moore Ranch project is therefore limited to consumptive impacts, i.e., water quantity. In the two pages of analysis that the SEIS devotes to groundwater impacts from restoration, there is no discussion of the fact that, historically, groundwater restoration at ISL projects has been unsuccessful. Indeed, the SEIS

merely incorporates the analysis presented in the GEIS and concludes that groundwater restoration impacts will be small. SEIS at 4-34.

Neither the GEIS nor the SEIS reflect the actual groundwater restoration history of ISL mines. The United States Geological Survey (“USGS”) recently published a survey of restoration efforts in Texas<sup>8</sup>. Hall, Susan, *Groundwater Restoration at Uranium In-Situ Recovery Mines, South Texas Coastal Plain*. U.S. Geological Survey Open-File Report 2009-1143 (2009). That report is attached hereto as Attachment G. That report concludes that based on restoration efforts in Texas - the state with the longest history of ISL mining and with the most comprehensive database of restoration information - no ISL uranium mine has ever restored groundwater to pre-mining conditions, even if one considers the inflated pre-mining average contaminant levels as a legitimate representation of baseline. Attachment G at 21. These findings are consistent with the NRC’s own data which also demonstrate that ISL 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. Moreover, the same NRC report determines that after “restoration” has been deemed complete, contaminant levels may actually rise and migrate due to geochemical conditions. *Id.* at 17, 22, 23. Because the data show that, to date, restoring groundwater to pre-mining conditions has been unachievable, the NRC’s conclusion that impacts to groundwater from groundwater restoration will be small is arbitrary and unreasonable. The

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<sup>8</sup> While Texas is an agreement state and the NRC therefore does not have direct regulatory authority over ISL mines in that state, the regulatory framework in Texas is substantially the same and the NRC’s, the NRC has oversight authority over the Texas regulatory system, and the technology used to “restore” groundwater is identical to the technology that will be used for the Moore Ranch project.

NRC should fully disclose the ISL industry's groundwater restoration history and reconsider the impacts to groundwater, both regionally and locally, based on that history.

3. *The NRC's Groundwater Restoration Impacts Analysis Contradicts NRC Regulations.*

Finally, the NRC appears to evaluate groundwater restoration impacts assuming that if baseline groundwater quality is not achieved, "class of use" quality would be achievable. GEIS at 2-48. However, this analysis ignores that the NRC regulations governing ISL groundwater restoration make no mention of "class of use" as a restoration standard, and mandates that groundwater must be restored to background or the maximum contamination levels listed in Criterion 5D. 10 C.F.R., Part 40, Appendix A, Criterion 5B; *see also, In the Matter of Hydro Resources, Inc.*, CLI-99-22, 50 NRC 3, 8-9 (1999). Indeed, even the NRC Staff recognizes that "class of use" is an inappropriate restoration goal. In 2009, the Staff issued a Regulatory Issue Summary ("RIS") where it concluded that Criterion 5B did not provide for restoration to "class of use" standards. RIS 2009-05 at 3-4 (April 29, 2009). Specifically the Staff wrote:

[T]he requirements in Criterion 5B of Appendix A apply to restoration of groundwater at uranium ISR facilities. The staff recognizes that NUREG-1569, "Standard Review Plan for In Situ Leach Uranium Extraction License Applications," provides guidance that is not consistent with the requirements in Criterion 5B of Appendix A discussed above. In particular, the NUREG-1569 discussion of groundwater restoration to "pre-operational class of use" as being a secondary standard is not accurate, **and is not an appropriate standard to use in evaluating license applications**. Criterion 5B contains the appropriate standards that will be applied to groundwater restoration at ISR facilities.

*Id.* at 3 (emphasis added). Because "class of use" is a restoration standard that is not legally cognizable, it should not be the basis for an analysis of groundwater impacts.

Moreover, the "class of use" restoration standard in the GEIS and SEIS illustrates a fundamental problem with the NRC's regulatory framework. As noted in SRIC's comments on the draft GEIS (and incorporated by reference herein), one of the significant problems with

issuing the GEIS is that it would become a proxy for ISL regulations. SRIC et. al., Comments on Draft GEIS, §III at 3-6 (Nov. 7, 2008). The NRC does not have regulations specifically relevant to ISL operations; instead, the NRC has adapted some of the conventional milling regulations to apply to ISL operations and have filled in the remaining gaps with license conditions, the ISL Standard Review Plan, and the GEIS. The way the NRC has used the GEIS and the SEIS in the Moore Ranch project context simply confirms this *ad hoc* approach to ISL regulation. Thus, because “class of use” is a restoration standard that is not legally cognizable, it should not be the basis for an analysis of groundwater impacts.

#### **V. The NRC Failed to Conduct Public Scoping for the SEIS**

In preparing the GEIS, the NRC held a series of public scoping meetings to determine what issues should be addressed in the GEIS. *See*, 72 Fed. Reg. 40,344 (July 24, 2007).

Although many public comments urged the NRC to consider the impacts of previous uranium mining and milling, it deemed impacts from past uranium mining and milling to be outside the GEIS’s scope. GEIS at 1-15.

In the SEIS, the NRC adopted the GEIS’s scope, i.e., it would not disclose or analyze the impacts from past uranium mining and milling. SEIS at 1-2. However, unlike the GEIS, the NRC did not conduct **any** public meetings regarding the SEIS’s scope. Instead, the NRC met with government agencies and groups it considered “interested” in the SEIS and apparently determined its scope based on those meetings. As a result, the SEIS fails to consider an entire class of impacts, i.e., the cumulative impacts of past uranium mining and milling combined with the current project, based on an exclusionary process. The failure to conduct scoping on the SEIS also prevents the public from raising issues in addition to the cumulative impacts of past uranium mining and milling that should have been considered in the SEIS. Moreover, the NRC’s failure

to conduct public scoping meetings in and of itself constitutes a violation of NEPA. The NRC must therefore scrap the current SEIS, conduct public scoping meetings, and issue another draft SEIS for public comment.

## **VI. Cumulative Impacts Analysis is Inadequate**

Finally, both the GEIS's and the SEIS's cumulative impacts analyses are grossly 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 either the GEIS or the SEIS in a number of respects.

Although arguably the proper document in which to consider the regional cumulative impacts of ISL mining, the GEIS fails entirely to analyze the cumulative impacts from proposed ISL projects. GEIS at 5-1 ("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"). Instead, the NRC defers cumulative impact consideration for site-specific SEISs. *Id.* Thus, by its own terms, the GEIS does not take the "hard look" at cumulative environmental impacts required by NEPA. However, as with the statement of purpose and need, the purported site-specific analysis relies heavily on information in the GEIS as its basis. The NRC thereby evades any meaningful cumulative impacts analysis altogether.

Because it relies substantially on information provided in the GEIS, the cumulative

impacts analysis in the SEIS is equally inadequate. Rather than meaningfully evaluating cumulative impacts, the SEIS instead simply lists other Federal projects (adapted from the GEIS) for which environmental impact statements have been or are proposed to be generated and included a seemingly boilerplate and conclusory statement that those projects “may” cause cumulative impacts. *See, e.g.*, SEIS § 5.5.1, p. 5-11 (“[s]urface water quality within the area administered by the BLM Buffalo Field Office could also be impacted by conventional oil and gas development, minerals extraction, road maintenance, rangeland grazing, and agriculture”); § 5.5.2, p. 5-11 (“within the proposed license area and within the area administered by the BLM Buffalo Field Office, there are either other ongoing or planned activities that would contribute to a cumulative impact on groundwater resources.”); § 5.7, p. 5-13 (“CBM development and production generates fugitive dust and exhaust from construction activities and air pollutants are emitted during operations.”). Indeed, the cumulative impacts analysis in the Moore Ranch SEIS is virtually identical to the cumulative impacts analysis in the Nichols Ranch SEIS, leaving the impression that the NRC merely cut and pasted the cumulative impacts analysis from the GEIS to each of the SEISs, changing the name of the project as necessary. Moreover, neither SEIS quantifies cumulative impacts, as required by NEPA.

Instead of presenting a conclusory analysis of the cumulative impacts, the NRC should have presented a detailed analysis that would have informed agency decision-making and public input. For example, the NRC should have disclosed what contaminants are released by coal bed methane operations, such as pit wastes, hydrological fracturing fluids, TENORM, and produced water and into which aquifers and surface waters those contaminants are likely released. The NRC should have then analyzed how the significantly elevated levels of uranium, radium and other pollutants that will be released from the ore zone and circulated through the aquifer at the

Moore Ranch project incrementally impact ground and surface water quality locally and regionally combined with contaminants from coalbed methane production.

A similar analysis of incremental impacts on important resources such as ground and surface water, air and ecosystems should have been conducted for all the other industrial projects in the area, including oil and gas development. As demonstrated in SRIC's Attachments H, I, and J, significant chemical contaminants are associated with oil and gas production, from the chemicals in drilling and hydrological fracturing fluids to the waste that goes into pits. As noted in Attachments H, I, and J, these chemicals have known adverse health effects, including carcinogenic and mutagenic properties, endocrine disrupting effects, and acute toxic effects. Instead of quantifying and analyzing the cumulative impacts of the Moore Ranch project combined with nearby oil and gas operations, the SEIS merely lists the number of oil and gas wells regionally. SEIS § 5.1.1.3 at 5-5 – 5-6.

The SEIS also fails entirely to evaluate either the cumulative impacts from non-Federal projects combined with the Moore Ranch project. The SEIS acknowledges that most rangeland in the area is privately owned and used for livestock grazing. *Id.* at 5-8. However, the SEIS fails to evaluate how the impacts from livestock grazing, such as erosion and surface water contamination might interact with the surface water impacts from the Moore Ranch project.

Finally, neither the SEIS nor the GEIS adequately quantifies or evaluates the cumulative impacts of the Moore Ranch project combined with contamination from past uranium mining and milling. Indeed, in the GEIS, the NRC determined 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. Although the GEIS does not provide any analysis of cumulative impacts from past uranium mining or milling, it does outline a protocol for determining whether these cumulative impacts should be considered in a site-specific evaluation. *Id.* at 5-2 and Appendix F. However, the GEIS’s decision-making process effectively pre-determines to what extent cumulative impacts will be analyzed in a site-specific context. *Id.* at 5-27. In the GEIS, the NRC states that it anticipates that most site-specific cumulative impact analyses will only require a Level 1 or Level 2 evaluation. *Id.* In other words, while evading any meaningful discussion of cumulative impacts in GEIS, the nevertheless NRC manages to restrict any future site-specific evaluations to the most superficial of analyses. This was clearly not Congress’s intent in enacting NEPA.

This proactive restriction of cumulative impacts analysis is illustrated by the treatment of cumulative impacts from past uranium mining and milling in the Moore Ranch SEIS. The NRC’s SEIS merely provides a list of the past, current and reasonably foreseeable uranium mining and milling projects in the region. SEIS, Table 5-1 at 5-2 – 5-3. This Table is obviously adapted from Table 5.2-1 in the GEIS. GEIS at 5-4 – 5-7. As in the GEIS, the SEIS provides no quantification or analysis of the cumulative impacts of the past, present and reasonably foreseeable projects combined with the Moore Ranch project.

Without disclosing and analyzing how those impacts, combined with the impacts from the Moore Ranch Project, affect the environment and public health, the NRC cannot make a fully informed decision and the public cannot have meaningful input into the decision-making process. The NRC must consider the full range of cumulative impacts in accordance with NEPA. Therefore, the NRC should re-issue the GEIS - which is the more appropriate document

for analyzing cumulative impacts - for public comment on its cumulative impacts analysis.

## **VII. Conclusion**

The above comments demonstrate that both the GEIS and the Moore Ranch SEIS are inadequate pursuant to NEPA, the NRC's regulations implementing NEPA, and the Council on Environmental Quality regulations implementing NEPA. The NRC must withdraw the Moore Ranch SEIS, begin a meaningful scoping process for the Moore Ranch environmental impact statement, and re-issue the SEIS for public comment. Further, the NRC should not rely on the GEIS for any aspect of site-specific analysis.

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.

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