URGEISCEmails

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To: NRCREP Resource
Subject: Uranium Recovery GEIS
Attachments: DGEIS Cover letter.pdf; NMAcommentsisrgeisfinal (2).pdf

Attached are the cover letter and comments on the Nuclear Regulatory Commission's *Generic Environmental Impact Statement on In Situ Uranium Recovery Facilities* (NUREG-1910). If you have any questions or problems with the attached documents, please contact me.

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United States Nuclear Regulatory Commission
Officer of Administration
Attn: Rulemaking, Directives, and Editing Branch
Washington, DC 20555-0001

SUBJECT: National Mining Association Comments Regarding the Nuclear Regulatory Commission's Draft Generic Environmental Impact Statement on In Situ Uranium Recovery Facilities (NUREG-1910)

Dear Sir/Madam:

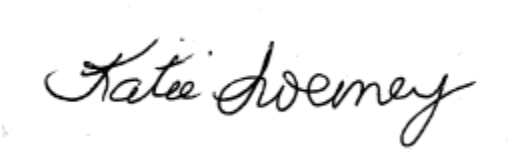
On July 28, 2008, the U.S. Nuclear Regulatory Commission (NRC) published for public comment a Draft Generic Environmental Impact Statement entitled *Generic Environmental Impact Statement on In Situ Uranium Recovery Facilities* (NUREG-1910 and hereinafter the "ISR GEIS"). 75 Fed. Reg. 43796. The deadline for comments on the Draft GEIS (DGEIS) was originally Oct. 7, 2008 but was subsequently extended to Nov. 7, 2008. The National Mining Association (NMA) appreciates the opportunity to comment on the DGEIS but in an effort to promote expeditious finalization of the ISR GEIS, NMA will not be taking advantage of the extended comment period. NMA strongly supports the preparation of the ISR GEIS. It is increasingly clear that NRC and its Agreement States will be receiving many new license applications for uranium recovery projects, the vast majority of which will be for ISR projects. Given NRC's resource constraints, expeditious review of these applications can only be achieved through an efficient licensing process.

NMA submits these comments on behalf of its uranium recovery members. NMA is the national trade association representing the producers of most of America's coal, metals, including uranium, industrial and agricultural minerals; the manufacturers of mining and mineral processing machinery, equipment and supplies; and engineering, transportation, financial and other businesses that serve the mining industry. NMA's uranium recovery members include current conventional and/or *in situ* uranium recovery (ISR) licensees, as well as potential future conventional and/or ISR license applicants.

NMA's comments (attached) are divided into two sections: Section I provides General Comments on the DGEIS, and Section II provides Specific Comments on the various chapters of the DGEIS.

Again, NMA appreciates the opportunity to comment on this very important effort. If you have any questions regarding this submission, please contact me at (202)463-2627 or ksweeney@nma.org.

Sincerely,



Katie Sweeney
Deputy General Counsel

I. GENERAL COMMENTS

A. NMA believes that the ISR GEIS should contain a more detailed discussion that highlights the *complementary* relationship between the natural geologic, hydrologic, and geochemical conditions that exist in the aquifers or portions thereof where ISR-amenable uranium deposits are located, which combined with the nature of the ISR process as reflected in ISR standard operating procedures (SOPs) and mandatory license/permit conditions, imposed by federal/State agencies (e.g., NRC, United States Environmental Protection Agency (EPA), Bureau of Land Management (BLM), etc.), provide substantial protection of public health and safety and the environment during the entire ISR project lifecycle. For a proper appreciation of the inherently benign nature of the potential impacts associated with ISR operations, it is imperative that interested stakeholders understand how effectively the combination of natural conditions (e.g., *redox, confinement, and slow groundwater travel times due to porosity and permeability*), process controls (*water quality parameters and upper control limits (UCLs), well construction, pump tests, mechanical integrity tests (MITs), wellfield balance, including the process "bleed" and monitoring wells*), and mitigation measures (*NRC-mandated groundwater restoration, including restoration action plans (RAPs), excursion controls, and EPA's 40 CFR Part 146.7 post-restoration authority*) safeguard public health and safety and the environment. NMA's Generic Environmental Report (GER) submitted during the scoping comment period provides a detailed discussion of how these natural conditions, process controls, and mitigation measures serve to minimize any potential significant adverse impacts, including minimizing, if not eliminating, any potential post-restoration migration of recovery solutions to adjacent, non exempt aquifers, or portions thereof. (Preamble, P-iii-P-xxxix, Chapter 5, Section 5.3).

B. NMA would like to reiterate its support for the development of the ISR GEIS and its applicability to license or license amendment applications currently pending before NRC Staff or for license or license amendment applications to be submitted in the future for the "tiering" of site-specific environmental assessments (EAs) for individual project license applications so that *unnecessary redundancy* in the environmental review process can be limited strictly, if not eliminated. NMA believes that the selection of the four identified ISR regions for analytical and organizational purposes is appropriate given the letters of intent (LOIs) currently before NRC Staff and the historic evidence of the presence of significant uranium deposits in these regions. However, NRC should state clearly to interested stakeholders that, to the extent applicable to site-specific conditions, the analyses and conclusions in the final ISR GEIS *will* be applied to proposed ISR projects outside the four identified ISR regions. This clarifying statement is consistent with a generic or programmatic approach to an EIS that, of necessity, utilizes "model" regions and facilities for fundamental analytical purposes, with the fact that both the surface and subsurface facilities and conditions at ISR project sites are substantially similar, if not identical and, finally, with the concept of narrowing the focus of site-specific environmental analyses, as detailed in NMA's GER.[1]

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[1] ***See generally* NMA GER at Chapter 3.**

In order to avoid any misunderstandings in the future, NRC must ensure that the message that the ISR GEIS *will be applicable* to sites that are physically outside of the four indentified regions is communicated to interested stakeholders to guarantee that the ISR GEIS' analyses and conclusions can be used, to the maximum extent practicable, by licensees/applicants when preparing site-specific license applications or by NRC Staff when reviewing such applications or preparing "tiered" environmental review documents for such applications.

C. As a general matter, interested stakeholders appear to have significant concerns regarding potential impacts on groundwater from ISR operations and, correspondingly, the viability of groundwater restoration based on NRC requirements for such restoration. NRC should be clear that, as stated in the ISR Standard Review Plan (SRP),[2] groundwater restoration standards currently are applied as "goals" and are set forth in mandatory license conditions and which allegedly reflect EPA's Resource Conservation and Recovery Act (RCRA) groundwater corrective action standards as incorporated by NRC in Criterion 5(b)(5) of 10 CFR Part 40, Appendix A. NRC's ISR SRP supports this conclusion:

> **"The primary *goal* of a restoration program is to return the water quality within the exploited production zone and any affected aquifers to pre-operational (baseline) water quality conditions….Still, as a *primary restoration goal*, licensees are required to attempt to return the concentrations of the monitored water quality indicator constituents to *within the baseline range of statistical variability for each constituent*….License conditions should be set up such that a license amendment is necessary before the applicant can revert to *secondary goals*."[3]**

Currently, the provisions of 10 CFR Part 40, Appendix A, Criterion 5B(6) are not directly applicable to ISR restoration as *regulatory requirements*, in the same manner as they are applied to groundwater corrective action at conventional uranium mills.[4] The requirements for groundwater restoration as delineated in 10 CFR Part 40, Appendix A, Criterion 5 are:

> **"At the point of compliance, the concentration of a hazardous constituent must not exceed—**

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[2] United States Nuclear Regulatory Commission, NUREG-1569, *Standard Review Plan for In Situ Leach Uranium Extraction License Applications*, (June, 2003) (hereinafter the "ISR SRP").

[3] *See* ISR SRP at 6-9.

[4] As stated throughout these Comments, NRC currently is proceeding with a rulemaking to make the requirements of 10 CFR Part 40, Appendix A, Criterion 5(b)(6) directly applicable to ISR facilities. However, at this time, the need for this rulemaking further supports the conclusion that such requirements are not directly applicable to ISR facilities until the finalization of the rulemaking.

(a) The Commission approved background concentration of that constituent in the groundwater;

(b) The respective value given in the table in paragraph 5C if the constituent is listed in the table and *if the background level of the constituent is below the value listed*;[56] *or*

(c) An alternate concentration limit established by the Commission."

10 CFR Part 40, Appendix A, Criterion 5(b)(5) (emphasis added).

As noted above, these requirements are based on the EPA's RCRA groundwater corrective action regulations set forth in 40 CFR § 264.92. These requirements were made applicable to Atomic Energy Act of 1954 (AEA)-regulated conventional uranium mills by the provisions of 40 CFR § 192.32(a)(2) as follows:

"(2) Uranium byproduct materials shall be managed so as to conform to the ground water protection standard in §264.92 of this chapter, except that for the purposes of this subpart:

(i) To the list of hazardous constituents referenced in §264.93 of this chapter are added the chemical elements molybdenum and uranium,

(ii) To the concentration limits provided in Table 1 of §264.94 of this chapter are added the radioactivity limits in Table A of this subpart."

The 40 CFR Part 192 groundwater corrective action requirements were incorporated in Criterion 5(b)(5) pursuant to the Uranium Mill Tailings Radiation Control Act's (UMTRCA's) requirement that NRC conform its AEA regulations for conventional mills to EPA's *generally applicable standards* for such facilities.[7] Accordingly, these corrective action criteria as applied currently to ISR restoration per Commission policy represent EPA's and NRC's conclusions regarding the appropriate regulatory controls to adequately protect public health and safety or the environment where potential impacts from hazardous chemicals and radionuclides in groundwater are involved.

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[5] Subsection (b)(6)(b) specifically refers to maximum contaminant levels (MCLs), which are "tap-water" quality standards that are deemed adequately protective of human health with respect to public drinking water sources.

[6] If, strictly speaking, the language of Criterion 5(b)(6) were directly applicable to ISR restoration, then the mandatory standard/"goal" would be baseline *or* an MCL, whichever is higher, *or* an alternate concentration limit (ACL). However, NMA recognizes that, according to NRC policy, licensees must actively attempt to restore groundwater within the recovery zone consistent with baseline or an MCL prior to applying for an ACL for a given constituent.

[7] 42 U.S.C. § 2114(a)(1).

In the past, the proper interpretation of Criterion 5's requirements apparently has not been communicated accurately as regulatory agencies and members of the public have asserted that the groundwater quality standard that *must* be satisfied is "background/baseline," when Criterion 5 actually states that the proper standard to be satisfied is *"background/baseline" or an "MCL," whichever is higher, or an ACL*. Thus, under EPA's RCRA groundwater corrective action standards (as incorporated into Criterion 5 by NRC), baseline/background is not *the mandated primary standard* if an MCL for the constituent of concern is higher. Pre-operational/baseline water quality, however, is the primary "goal" under many NRC license conditions while an MCL or other secondary standard may be the *secondary* "goal" but the regulations *actually require* baseline/pre-operational quality *or* an MCL, whichever is higher, *or* an ACL.

NRC practice at conventional uranium mills and in various NRC ISR license conditions requires some active efforts to reach a primary or secondary *goal* before a licensee seeks an ACL. It is worth noting, however, that conventional mill licensees have a legal *right* to apply for and receive an ACL; whereas, under NRC's current policy applying these criteria to ISR restoration, licensees' can apply for the equivalent of an ACL. An ACL is a site-specific, constituent-specific, risk-based, groundwater quality standard that requires an affirmative demonstration by the licensee that maintenance of site groundwater at that constituent-specific level will not pose a significant threat to public health and safety, if neither of the first two standards is *reasonably achievable*. An ACL is a manifestation of the reality that "*reasonably achievable*," "*reasonably practicable*" corrective action in groundwater systems with natural variability must reflect the "as low as reasonably achievable" (ALARA) principle, but still can provide adequate protection of public health and safety. NRC's requirements for ACLs currently are extremely comprehensive and stringent and include the following criteria that must be satisfied:

> **"In making the present and potential hazard finding, the Commission will consider the following factors:**
>
> **(a) Potential adverse effects on ground-water quality, considering—**
>
> **(i) The physical and chemical characteristics of the waste in the licensed site including its potential for migration;**
>
> **(ii) The hydrogeological characteristics of the facility and surrounding land;**
>
> **(iii) The quantity of ground water and the direction of ground-water flow;**
>
> **(iv) The proximity and withdrawal rates of ground-water users;**
>
> **(v) The current and future uses of ground water in the area;**

(vi) The existing quality of ground water, including other sources of contamination and their cumulative impact on the ground-water quality;

(vii) The potential for health risks caused by human exposure to waste constituents;

(viii) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents;

(ix) The persistence and permanence of the potential adverse effects.

(b) Potential adverse effects on hydraulically-connected surface water quality, considering—

(i) The volume and physical and chemical characteristics of the waste in the licensed site;

(ii) The hydrogeological characteristics of the facility and surrounding land;

(iii) The quantity and quality of ground water, and the direction of ground-water flow;

(iv) The patterns of rainfall in the region;

(v) The proximity of the licensed site to surface waters;

(vi) The current and future uses of surface waters in the area and any water quality standards established for those surface waters;

(vii) The existing quality of surface water including other sources of contamination and the cumulative impact on surface water quality;

(viii) The potential for health risks caused by human exposure to waste constituents;

(ix) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents; and

(x) The persistence and permanence of the potential adverse effects."

10 CFR Part 40, Appendix A, Criterion 5(b)(6)(a&b).

Thus, the licensee may be able to make such a showing based on satisfying some or all of these rigorous requirements which, for example, may include the fact that, given site conditions, the constituents will not migrate off-site, the constituent

may not be a "hazardous" constituent (e.g., has no MCL) or the constituent's level falls within the water's prior "class-of-use" limits.

Frequently, interested stakeholders mistakenly claim that all site groundwater parameters must be returned "exactly" to pre-operational background/baseline concentrations without understanding exactly what a "background/baseline" concentration for a given constituent does and, more importantly, does not represent. It is not a *single, hard-and-fast, number* representing the level(s) of that constituent in groundwater in the portion of the aquifer in question.

The dilemma that restoration to precise, numeric baseline conditions on a parameter by parameter basis presents is that *natural parametric variability* in groundwater systems, both from samples taken over time from an individual well, and/or separate closely spaced wells in the same stratigraphic horizon on the same sample date, commonly exceed precisely calculated values. For example, in Hydro Resources, Inc.'s (HRI) Unit 1 mine area baseline well analysis (which incidentally has been evaluated in by the NRC[8]) a high degree of variability is apparent. HRI's data from Unit 1 is comprised of baseline well samples in a planned production mine unit that was drilled by Mobil, yet never placed into production. The mine unit was encircled by a ring of monitor wells that were spaced at 400 feet apart and 400 feet from the wellfield. Each of these monitor wells, and every planned injection and extraction production well, for a total of 47 wells, was sampled twice, one month apart.

The result of the sampling showed a high degree of variability, both from samples taken two times from an individual well and/or separate closely spaced wells in the same Westwater horizon on the same sample date. To illustrate the variability among individual wells broken out by monitor wells and production wells statistics for the parameters total dissolved solids (TDS), Chloride, Sulfate, Uranium, ^{226}Radium, ^{222}Radon, Gross Alpha (α) are shown below.

Parameter	Production Baseline Max.	Production Baseline Min.	Production Baseline Avg.	Monitor Well Ring Max.	Monitor Well Ring Min.	Monitor Well Ring Avg.	MCL
TDS	386	240	254	590	0	284	500
Chloride (mg/l)	34	0	5	41	0	6	250
Sulfate (mg/l)	44	20	33	220	21	38	250
Uranium	100	0	12	4	0	0	30

[8] *See* United States Nuclear Regulatory Commission, NUREG-1508, *Final Environmental Impact Statement to Construct and Operate the Crownpoint Uranium Solution Mining Project, Crownpoint, New Mexico* (March, 1997).

(µg/l)							
^{226}Ra (pCi/l)	200	0	18.1	33	0	2.5	5
^{222}Rn (pCi/l)	1,100,000	4100	140,677	32,000	0	22,721	300[9]
Gross α (pCi/l)	610	1	74	110	22	10	15

Moreover, beyond the variability found among closely spaced wells in the same Westwater horizon, the Unit 1 data set shows a similar high degree of variability from samples taken two times at a one month interval from individual wells--well after well, parameter after parameter. It is not uncommon to see variability among individual baseline production or monitor well parameters by large percentages, and even multiples thereof, from the same well on different dates.

So the pitfall that may be encountered when interested stakeholders mistakenly claim that all site groundwater parameters must be returned "exactly" to pre-operational background or baseline water quality levels rather than viewing that standard as a primary "goal" or seeking to restore "*consistent with* background or baseline is that such a rigid regulatory approach would set the standard so high that it would be unobtainable, *even with no mining*. Given these natural variations in water quality in groundwater systems, restoring "consistent with" a background/baseline average number must imply some appropriate statistical variability rather than a hard-and-fast number.

Indeed, as NRC has expressly acknowledged in its ISR SRP, natural groundwater systems at ISR sites necessarily result in highly variable groundwater quality characteristics across a proposed permitted area:

> **"For example, since uranium rollfront deposits are formed at the interface between chemically oxidizing and reducing environments, *water quality characteristics may differ significantly across the rollfront*."**

ISR SRP at 2-26.

> **Due to this natural variability, NRC permits applicants/licensees "*the option of determining numerical restoration limits [background/baseline concentrations] for each monitored constituent on a well-by-well basis, or as a statistical average applied over the entire wellfield*."**

ISR SRP at 6-8.

This is a *necessary* option for licensees/applicants because, as NRC has recognized, "restoration activities are not likely to return ground-water quality to exact water

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[9] EPA proposed ^{222}Rn MCL. [Federal Register: November 2, 1999 (Volume 64, Number 211)].

quality that existed *at every location prior to in situ leach operations.*" ISR SRP at 6-9. Accordingly:

> **"licensees are required to attempt to return the concentrations of the monitored water quality indicator constituents to within the range of statistical variability for each constituent."**

As a result, licensees are required to:

> **"identify the type of statistical analysis and criteria that will be used to determine whether concentrations of water quality parameters in the affected aquifers [or portions thereof] fall within an acceptable range of baseline variability."**

Therefore, restoring groundwater quality in affected aquifers, or portions thereof, *consistent with the background/baseline average concentration and within an appropriate statistical range of variability*, properly reflects "real-world" conditions and is adequately protective of public health and safety because, as determined by EPA, such affected aquifers cannot now nor ever in the future serve as a public drinking water source.[10]

Further, while NRC has made groundwater restoration a regulatory requirement, it should be characterized as a "mitigation" measure whose primary purpose is to minimize, if not eliminate, the potential for post-restoration migration of recovery solutions to adjacent, non-exempt aquifers. Without a thorough understanding of the bases for NRC's groundwater restoration *goals* and requirements, interested stakeholders could assert that ISR operators can be required to restore site water quality to conditions better than those produced by nature. Discussion of restoration as a "mitigation measure" can be found in NMA's GER (Chapter 5, Section 5.3).

D. As stated in NMA's comments on the DGEIS scoping process, NRC should make crystal clear the "phased, iterative" nature of the development of ISR project sites. NRC has provided interested stakeholders with a detailed discussion of this issue in ISR SRP. The ISR SRP discusses the first two phases of ISR uranium recovery licensing: (1) *Site Characterization* (Chapter 2) and (2) *Operations* (Chapter 5). The *Site Characterization* phase involves a *general* NRC Staff review of a license applicant's pre-operational data collection, site assessments, and proposed SOPs. *See e.g.,* ISR SRP at 2-1, 2-5, & 2-17. However, the ISR SRP specifically notes that "[r]eviewers should keep in mind that the development and initial licensing of an *in situ* leach facility is *not based on comprehensive information….reviewers should not expect that information needed to fully describe each aspect of all the operations will be available in the initial application*." ISR SRP at 2-1 & 2-2 (emphasis added). The *Site Characterization* phase of ISR uranium recovery projects is designed to provide *general information* demonstrating the location of an ore body and the techniques or

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[10] ***See*** **40 CFR § 146.4(b).**

procedures to be used to recover uranium and to monitor relevant parameters such as water quality and confinement. This phase is not, however, designed to provide detailed site-specific information (e.g., water quality parameters and UCLs) and, as such, NRC license conditions generally require extensive future data collection as the project proceeds forward.

On the other hand, the *Operations* phase of ISR uranium recovery projects as described in Chapter 5 of the ISR SRP requires detailed site-specific activities, such as the design of wellfields, drilling of injection, extraction, and monitoring wells, an assessment of whether such wells, piping or other equipment is properly installed and determination of water quality parameters, UCLs, and pump testing to further delineate and confirm confinement.

Phasing is further demonstrated by requirements to begin restoration in wellfields no longer in production while production is proceeding in other wellfields. Yet another example of phasing is a typical license condition that requires cessation of any site activities to conduct a cultural resources inventory if previously undetected historic or cultural properties are discovered during the development and construction of wellfields. Thus, "phasing" is an essential and integral component of *all aspects* of ISR uranium recovery projects.

The provisions of 10 CFR § 40.32(e) which can limit site pre-licensing construction activities further reflect the "phased" nature of the licensing process and, indeed, could severely restrict phase one activities if conservatively interpreted. NRC should reassess 10 CFR § 40.32(e) regarding potential pre-licensing site construction activities to reflect the "discretionary" nature of that regulation. In light of potential mitigation measures (i.e., State or federal agency-imposed EAs & financial assurance) available to ISR operators under other regulatory regimes, NRC Staff should exercise its discretion to allow licensees as much flexibility as possible to undertake, at their own risk, pre-licensing construction activities, given that, as the DGEIS acknowledges, there are no long-term or significant impacts associated with ISR site pre-licensing construction activities. Agencies such as BLM and the Wyoming Department of Environmental Quality (WDEQ) require specific types of site-specific assessments such as a "Plan of Operations" or a "Permit to Mine" that provide NRC Staff with an independent assessment of the potential impacts associated with certain site-specific, pre-licensing construction activities that do not directly implicate NRC's AEA jurisdiction (i.e., do not involve the injection of lixiviant to recover uranium which constitutes "uranium milling" according to the Commission's 2000 decision). NRC Staff should abandon its current rigid interpretation of Section 40.32(e) and evaluate applicant/licensee requests to conduct pre-licensing construction activities on a request-by-request basis, including consideration of independent assessments of potential impacts from such activities by relevant State or federal agencies when determining whether such activities are permissible under Section 40.32(e).

E. The DGEIS states that it was prepared in accordance with the regulations that are currently in place regarding ISR operations. However, while it is important for interested stakeholders to understand the bases for NRC's programmatic environmental review of ISR operations, it is also important that the same stakeholders understand the substance and timing of any new regulatory or policy initiatives that potentially could affect the manner in which ISR operations are regulated. For example, NRC and EPA have proposed and currently are developing a new rulemaking to revise 10 CFR Part 40, Appendix A Criteria (specifically Criterion 5(b)(5)) regarding groundwater restoration standards to apply directly to ISR projects. The revision of Appendix A Criteria to reflect these changes is critical to a proper understanding of how groundwater restoration will be conducted and how NRC will regulate it. NRC will not compromise any of the analyses or conclusions offered in the DGEIS if it provides references to rulemaking proceedings or policy initiatives that may have potential affects on the ISR regulatory structure.

F. As stated in NMA's comments on Draft Regulatory Guide DG-3204, NRC should be sure to include appropriate references to complementary regulatory regimes and their associated safeguards that are relevant to ISR projects prior to the issuance of an NRC license and during active ISR operations or site decommissioning, including groundwater restoration. While the DGEIS does contain some references to other applicable regulatory programs and their associated safeguards, NMA believes that NRC should thoroughly review the DGEIS and ensure that interested stakeholders are aware of the substantial safeguards available to protect public health and safety and the environment from such regulatory regimes (e.g., EPA 40 CFR Part 190 requirements, NRC guidance documents, EPA/State regulations for aquifer exemptions and Underground Injection Control (UIC) permits).

G. As will be discussed in the Specific Comments below, NMA believes that NRC's list of issues that have been found to be outside the scope of the DGEIS includes an item that properly is within its scope. NRC Staff has determined that the topic of "Alternative Sources of Uranium" is outside the scope of the DGEIS; however, NMA believes that NRC Staff's conclusion on this issue is incorrect. NMA believes that NRC has ignored the fundamental reality of future ISR operations which is that ISR licensees could process uranium-loaded ion-exchange (IX) resins from various types of water treatment operations including: (1) ISR operations; (2) heap leaching operations which typically generate uranium-loaded IX resins; (3) mine-water treatment operations at a mine that needs to be de-watered to allow for underground mining; (4) ground or surface water remediation; or (5) water treatment at public drinking water facilities. In short, uranium-loaded IX resins from these diverse sources likely will be processed at an ISR central processing facility in the near future. As a result, NMA believes that analysis of the potential impacts (or lack thereof) of processing such uranium-loaded IX resins at ISR central processing facilities must be included in the ISR GEIS.

Further, NRC's analyses and conclusions in the DGEIS effectively support this position. For example, NRC's analysis of the potential impacts of ISR operations do indeed consider the potential impacts of receiving uranium-loaded IX resins from satellite wellfields. The potential impacts from the transportation of such resins from a satellite wellfield owned and/or controlled by the same licensee or a different ISR licensee (or from a water treatment licensee) to a licensed ISR central processing facility are identical. In addition, the potential impacts associated with receiving and processing such resins and with final disposition of the resulting waste materials as 11e.(2) byproduct material also are identical to processing uranium-loaded IX resins from a wellfield directly adjacent to a licensee's central processing facility.[11] Thus, NMA believes that NRC merely needs to revise its initial sections on the ISR GEIS' scope to state that the analyses and conclusions in the ISR GEIS will be equally applicable to this "toll milling" of uranium-loaded IX resins from other sources if suitable for processing at a licensed ISR central processing facility.

Moreover, while NMA agrees that the potential impacts associated with uranium recovery at a conventional uranium mill facility are outside the scope of the ISR GEIS, nevertheless, the ISR GEIS' analyses and conclusions regarding "toll milling" of uranium-loaded IX resins should be equally applicable to a conventional uranium recovery facility that possesses licensed IX stripping and elution circuits.

H. NMA believes that NRC should be consistent as to whether the subject of the ISR GEIS is in situ leaching (ISL) or in situ recovery (ISR) and as to whether use of the term ISL/ISR "milling" is appropriate. Recently, industry has begun to use the term "ISR" rather than "ISL" to identify "in situ *uranium recovery*" and, therefore, NMA prefers use of the term "ISR" in the ISR GEIS. Additionally, as stated in the Glossary, "milling" typically involves the crushing and grinding of ore (rock), which is not, in any way, part of the ISR process. Thus, while the Commission has effectively ruled that "uranium recovery" using the ISR method is "processing" as opposed to "mining" and, still effectively, the functional equivalent of "milling underground," NMA believes NRC should not refer to the process as ISL/ISR "milling." As a practical matter, ISR operations are not actually "milling underground" but are merely characterized as such, because the Commission determined that ISR processes which separate uranium through chemical reactions are similar to some aspects of the conventional uranium "milling" recovery processes, albeit occurring underground; thus characterizing it as "milling" offers a

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[11] To the extent that there are any differences in potential impacts associated with this "toll milling" of uranium-loaded IX resins from sources other than ISR operations, these potential impacts *can and should be* evaluated in the ISR GEIS as ISR licensees undoubtedly will seek NRC authorization to receive and process such resins in the near or distant future. This approach demonstrates NRC's fundamental misunderstanding of NMA's comments in its GER regarding uranium-loaded IX resins from other than ISR operations which were not "intended to address the broader issues of how to meet the U.S demand for uranium or what sources of uranium should be used." *Compare* NRC ISR GEIS Scoping Report at Section 4.11, Page A-27 (Appendix A of the DGEIS).

misleading impression of ISR processes and the extent of potential impacts associated with ISR recovery as compared with conventional uranium recovery. This would require removing "milling" throughout the text, including the titles of the four identified regions in Chapter 3.

Since the Commission has no jurisdiction over conventional uranium *mining* as such, NRC may wish to make it clear to interested stakeholders that ISR operations are not uranium *mining* per the Commission's 2000 interpretation that ISR subsurface uranium recovery activities effectively constitute "milling underground" and, as a result, that ISR operations are subject to the Commission's AEA jurisdiction as licensed uranium recovery. This is not to say that other federal/State regulatory regimes, such as EPA's UIC program, do not have authority with respect to some aspects of ISR projects. However, many relevant State officials, much less the general public, do not understand this critical distinction and NRC should make this point clear.

I. As a general proposition, NMA believes that NRC should ensure that the ISR GEIS analysis uses both regulatory and ISR industry terms properly and should be consistent when using such terms. This general comment addresses several different issues:

1. First, NRC should ensure that the terms defined in the ISR GEIS' Glossary are defined properly. As will be shown in the Specific Comments below, NMA believes that several of the terms used in the Glossary section need to be re-evaluated in light of prior NRC agency actions and legal interpretations. Each of the terms NMA has identified is discussed in Specific Comments Section L, #13 below;

2. Second, any regulatory or ISR industry term that is defined in both the ISR GEIS' analytical and Glossary sections must use the same definition. There are several terms included in analytical sections that are defined and/or used differently than the corresponding definitions in the Glossary section. It is important that the ISR GEIS be consistent in its definition and/or use of these terms as the ISR GEIS is intended to serve as the primary analytical document for environmental reviews of ISR projects, and failure to be consistent could result in flawed site-specific analyses and misunderstandings during potential administrative hearings on license, license amendment or license renewal applications. NMA will address each of the identified terms in the Specific Comments section;

J. NRC's discussion of the potential impacts associated with ISR operations should be sensitive to issues that have been raised in the past by parties in opposition to proposed ISR projects or by technical experts that have opined on such issues in these proceedings. For example, as will be stated in the Specific Comments, the New Mexico region has experienced significant opposition to ISR operations in the Church Rock and Crownpoint areas. In the administrative litigation that accompanied this license application, thousands of pages of briefs and

expert testimony were offered. These documents should serve as a significant resource to NRC Staff when tailoring its regional discussion of New Mexico. This approach should hold true for any other region where additional information such as this is available.

K. It is important to understand how NRC regulates ISR operations to include examples of NRC Staff-issued license conditions for a variety of ISR processes such as historic and cultural resource preservation, establishment of final site water quality parameters, and performance-based license activities. Thus, NRC should review the DGEIS to determine where to insert references to sample license conditions, which can demonstrate to the public at large the comprehensive nature of mandatory controls.

L. It is important that NRC provide a discussion of performance-based licensing and license conditions in the ISR GEIS. This discussion should reflect the fundamental tenets of performance-based licensing as stated by the Commission in SECY-98-144:

> **"A performance-based requirement relies upon measurable (or calculable) outcomes (i.e., performance results) to be met, but provides more flexibility to the licensee as to the means of meeting those outcomes. A performance-based regulatory approach is one that establishes performance and results as the primary basis for regulatory decision-making, and incorporates the following attributes: (1) measurable (or calculable) parameters (i.e., direct measurement of the physical parameter of interest or of related parameters that can be used to calculate the parameter of interest) exist to monitor system, including licensee, performance against clearly defined, objective criteria, (2) licensees have flexibility to determine how to meet the established performance criteria in ways that will encourage and reward improved outcomes; and (3) a framework exists in which the failure to meet a performance criterion, while undesirable, will not in and of itself constitute or result in an immediate safety concern. The measurable (or calculable) parameters may be included in the regulation itself or in formal license conditions, including reference to regulatory guidance adopted by the licensee."**

Since the advent of performance-based licensing, ISR operators were presented with the opportunity to apply for and receive performance-based licenses that would provide such operators with the flexibility to allow certain modifications to its license without the need for a license amendment. In addition, ISR operators also have been permitted to utilize performance-based license conditions (PBLCs) that pertain directly to a single site activity such as the initiation of new wellfield operations. Over time, several ISR operators have received and used PBLCs, which has resulted in more efficient site operations. Thus, performance-based licensing, in either form and which has been expressly endorsed by the Commission on many occasions, is a critical aspect of efficient and effective ISR operations under NRC's

regulatory regime and a detailed discussion of this type of licensing must be included in the ISR GEIS.

II. SPECIFIC COMMENTS

A. EXECUTIVE SUMMARY

1. Page xxxviii-xxxix: The section on land use impacts refers to potential impacts from construction activities to ecological, historical, and cultural resources and characterizes such potential impacts as SMALL to LARGE. These potential impacts should be assessed in a separate category as typical land use impact evaluations include items such as loss of grazing and not impacts related to ecological, historical or cultural resources, which can be addressed separately. Thus, NRC should not address these potential impacts in the land use impact section.

2. Page xl: NRC makes the statement that only ten (10) percent of the licensed/permitted area will be disturbed during an ISR project's lifecycle. This statement should be revised to make clear that the percentage of land disturbance at a given licensed site is highly site-specific and can only be determined after a site is licensed and the ISR operator has a complete understanding of the areal extent and commercial recoverability of the identified ore body. If NRC believes that such a statement (i.e., 10%) is warranted, then it should be supported by specific data from previous ISR projects; otherwise, it should be revised to state that "only a small portion of the permit area is disturbed by operations."

3. Page xli: The analysis states that alterations to the ore body's chemistry would be SMALL due to the requirement to restore to the statistical range of baseline water quality. NRC needs to be clear that baseline for a given constituent refers to a water quality value based on an average within individual wells or wellfields, while traditional usage of the term "class-of-use" implicates a range of water quality values such as for agricultural or industry uses. NMA believes that it is appropriate to restore "consistent with" a background/baseline average within some approved range of statistical variability given the natural variability inherent in such groundwater systems.

In addition, the discussion of potential groundwater impacts during operations states that the amount of water used could be substantially reduced by available treatment methods. NRC should explain this statement in more detail.

4. Page xli: NMA believes that the statement that consumptive use of groundwater during restoration has been less than such use during operations is incorrect. Required restoration activities for any given wellfield typically remove more than six (6) times the volume of groundwater removed during uranium recovery operations. Commonly, 40 pore volumes are recovered from a wellfield to reach an economic recovery level. If a one (1) percent bleed is maintained, a total of

0.4 pore volumes will be consumptively removed during production operations. A typical restoration plan involves 1 pore volume of groundwater sweep and five (5) pore volumes of reverse osmosis treatment. The 1 pore volume of groundwater sweep is consumptively removed. However, the DGEIS consistently uses a 30% brine rate assumption for reverse osmosis operations. Therefore, 1.5 pore volumes (30% of 5 pore volumes) are consumptively removed during reverse osmosis restoration operations. Thus, in total, 2.5 pore volumes are consumptively removed to achieve groundwater restoration while 0.4 pore volumes are consumptively removed during uranium recovery operations. Therefore, NRC should specifically address the question of whether continued consumptive use of valuable groundwater resources during restoration to be consistent with a hard-and-fast baseline number after the asymptotic curve has been achieved makes sense in light of the ALARA standard.

5. Page xliii: As described in General Comment F, NRC's reference to National Pollutant Discharge Elimination System (NPDES) permits is an example of the need to be clear as to which licenses/permits ISR projects require. Prior to the Commission's decision in 2000 which held that restoration fluids are 11e.(2) byproduct material, ISR operators could obtain a NPDES permit, treat restoration fluids to meet appropriate NPDES permit requirements, and discharge the treated fluids down a stream or other surface water source from the project site.[12] After the Commission's 2000 decision, it appears that the use of a NPDES permit to treat and release 11e.(2) byproduct material in the form of restoration fluids may not be possible, since NPDES rules do not allow ISR operators to discharge treated process "bleed" fluids from a licensed site. NRC should be specific as to what ISR activities are appropriate for the use of a NPDES permit.

6. Page xliv: In the discussion of waste management impacts during operations, waste treatment such as "radon settling" is mentioned for liquid wastes. Presumably, this text should be revised to reference "radium settling."

7. Page xlv: Sections regarding noise impact assessments state that all uranium districts are located more than 300 meters (1,000 feet) from the nearest community. However, uranium districts are large areas that contain communities and may, in some cases, contain a single resident that potentially could be impacted by noise generated at the site. Generally, it is unknown whether a facility may, at some point, be located near a community or a single resident; so the statement should be qualified perhaps by the term "generally."

8. Page xlv: The discussion of noise impacts during aquifer restoration mentions potential impacts from construction which would not occur unless an adjacent wellfield was being constructed while restoration in another wellfield was proceeding.

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[12] ***See* 40 CFR 440.34.**

9. Page xlvii: In the discussion on visual and scenic impacts from construction activities, it is stated that a Prevention of Significant Deterioration (PSD) Class I area is located near Wind River National Park. A PSD area is an air quality classification which already was discussed in the air quality impact evaluation and should not be included in a visual or scenic resource evaluation.

10. Page xlix: NRC states that there is an absence of yellowcake production (i.e., drying and packaging) during aquifer restoration. Due to the phased nature of ISR projects, this statement may not be correct in all instances. First, while potential uranium recovery is limited during aquifer restoration, particularly as restoration proceeds, ISR licensees may continue to remove uranium from groundwater due to the "sequential" development of ISR wellfields and the need to remove uranium from recovery zone groundwater during restoration. More specifically, ISR operators that develop wellfields in sequence will be engaging in groundwater restoration in some wellfields while developing and engaging in active uranium recovery operations in others. Thus, it is likely that yellowcake production from active uranium recovery operations in a wellfield will be occurring simultaneously with groundwater restoration in a depleted wellfield. This statement also does not account for potential uranium recovery from satellite wellfields that generate uranium-loaded IX resins for processing at the central processing facility, even during active uranium recovery or groundwater restoration in other adjacent wellfields. Therefore, NRC should be clear that the "phased" manner in which an ISR operators conduct uranium recovery operations and groundwater restoration may result in some yellowcake production during groundwater restoration.

11. Page xxxiv: NRC has stated that its has made a "policy decision" to prepare site-specific EISs for new or re-starts of conventional uranium milling facilities, including heap leaching facilities, under 10 CFR § 51.20(b)(8). This statement does not appear to be within this document's scope in light of NRC's statements in its scoping report and the DGEIS that the latter is limited to ISR operations and does not address conventional uranium mills or heap leach facilities. Absent an express regulatory requirement for an environmental impact statement (EIS) (such as the requirement in 10 CFR § 51.20(b)(8) that NRC determined triggered the need for the ISR GEIS), NRC should rely on its National Environmental Policy Act (NEPA) guidance in NUREG-1748,[13] Figure 1, which only requires an EIS in the event that a site-specific EA cannot produce a Finding of No Significant Impact (FONSI). Additionally, the statement fails to account for the circumstances associated with at least one existing conventional uranium mill and, as such, is inconsistent with the facility's current license conditions that address re-starting the facility. Currently, Kennecott Uranium Company (KUC), a member of NMA, owns the Sweetwater Uranium Project located in the State of Wyoming. The Sweetwater facility has been on standby status since 1983 and was granted a performance-based operating license on August 18, 1999 based on a comprehensive environmental report (ER) and tailings management plan. Thus, in the event that

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[13] **United States Nuclear Regulatory Commission, NUREG-1748, *Environmental Review Guidance for Licensing Actions Associated with NMSS Programs*, (August 2003).**

KUC decides to re-start active uranium milling operations, it can only do so in accordance with NRC license conditions mandating that certain requirements be satisfied prior to re-starting the facility and licensed activities. As a result, given that such an environmental review already has been conducted, no new EIS should be required for the re-start of this facility and the imposition of such a requirement in an ISR GEIS has the effect of unilaterally modifying KUC's license in a document that does not address conventional milling and that does not constitute any final agency action. Thus, NMA believes that NRC should re-consider the wording of this statement to reflect this scenario and other potential licensee or project-specific scenarios.

B. CHAPTER ONE

12. Page 1-1, Lines 32-37: See General Comment B regarding the need to reference the substantial similarities between the surface and subsurface facilities and conditions at ISR project sites.

13. Page 1-2, Lines 11-13: As discussed in General Comment B, NRC states that the conclusions of the ISR GEIS will be incorporated into site-specific EAs to the extent practicable. NMA would like clarification on NRC's timeline "goal" for the completion of EAs "tiered" off of the ISR GEIS considering the thirty (30) days allotted for public comment.

14. Page 1-3, Lines 1-4: As discussed in General Comment B, NRC should state unequivocally that, while the conclusions of the ISR GEIS will be expressly tailored towards the four regions identified in Chapter 3, nevertheless such conclusions will be used for ISR license applications outside these four regions as appropriate. NMA suggests that a more positive statement is warranted as a result of the similarities (surface and subsurface) between such facilities[14] and, therefore, the ISR GEIS should state that, to the extent appropriate, the ISR GEIS' analyses and conclusions *will* be used to "tier" EAs at such sites.

15. Page 1-5, Lines 3-23: As discussed in General Comment D, NRC needs to provide interested stakeholders with a more detailed description of the various stages of ISR project development in an effort to communicate that ISR projects must be conducted in a "phased, iterative" manner which means that all aspects cannot be approved "up-front." NMA discussed this issue in its scoping comments, and NMA members such as Hydro Resources, Inc. (HRI) have provided NRC Staff during administrative litigation with numerous explanations of the "phased, iterative" nature of ISR projects, and NRC's ISR SRP presents the development of ISR projects as "phased" by noting differences between activities encompassed in Chapter 2 entitled *Site Characterization* and Chapter 5 entitled *Operations*. Additionally, as noted in General Comment D above, 10 CFR § 40.32(e) can limit pre-licensing construction activities further emphasizing the phased nature of ISR projects. With respect to the latter, NMA suggests that NRC Staff consider

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[14] ***See* General Comment A.**

exercising its discretion under Section 40.32(e) to allow pre-licensing construction activities, as long as adequate safeguards and mitigation measures are in place to minimize or eliminate environmental impacts in the event a license is not issued.

16. Page 1-9, Line 4: As stated in General Comment E, NRC states that the DGEIS is based on regulations in place at the time of the document's preparation. There are several references in the DGEIS to an ongoing rulemaking geared towards groundwater restoration standards, but there should be more specific information presented on this rulemaking and its potential impacts on the current ISR regulatory program (i.e., revisions of 10 CFR Part 40, Appendix A, Criterion 5(b)(5)) and, possibly, the potential application of 40 CFR Part 61, Subpart W's first work practice standard to ISR site evaporation ponds. It is important for industry members and interested stakeholders to understand how the current regulatory program operates and how the proposed rulemaking or other regulatory/policy efforts potentially could impact this program.

17. Page 1-9, Lines 33-47: In the *Water Resources* section and as described in General Comment A, NRC should provide a more detailed discussion of the natural conditions at ISR-amenable project which combined with ISR process controls and mitigation measures as contained in mandatory license conditions, including specifically groundwater restoration, minimize the potential for significant adverse impacts to adjacent, non-exempt drinking water supplies.

18. Page 1-13, Line 24: As stated in General Comment G, NRC's reference to the issue of "Alternative Sources of Uranium" in Section 1.5.4 being *outside of the scope of the [ISR] GEIS* is incorrect and ISR GEIS analyses must include analysis of the potential impacts of "toll milling" of uranium-loaded IX resins from any source that produces them, whether it be resins from other licensed ISR operations, remote IX facilities, water treatment operations (e.g., drinking water treatment facilities, mine de-watering operations, etc.) or heap leaching facilities. For example, NMA's GER states:

> **"Thus, while ISR uranium recovery licensees are viewed as the predominant users of synthetic IX resins for uranium recovery operations, both ISR and conventional uranium recovery licensees have, and have had, the capacity to process uranium-laden IX resins. With NRC's or an Agreement State's authorization, conventional uranium recovery facilities are allowed to utilize IX stripping and elution facilities at their licensed site(s). Indeed, the 1980 GEIS for conventional uranium milling specifically identified IX resins as a potential source of uranium recovery, whether from on-site processing or off-site water treatment:**
>
> > **'the resulting impure dilute leach solutions have to undergo concentration and purification as a prerequisite to the production of a final, high-grade, uranium product. A number of major techniques are used to affect this stage of the milling process. They are: ion-exchange…solvent extraction…." NUREG-0706 - Final Generic**

Environmental Impact Statement on Uranium Milling, Project M-25,Volume 1.. September 1980.'

Further, while conventional uranium recovery facilities may create uranium-laden IX resins as a part of their processing operation, NRC also has identified IX resins from various water treatment operations as a potential source of uranium recovery material:

> **'The Nuclear Regulatory Commission (NRC) and Agreement States have received, and in some cases approved, requests to allow a uranium mill to process feed material that was not natural (native, raw) uranium ore and dispose of the resulting waste in the facility's tailings impoundment. In those cases, the feed material was generally either processing wastes from other extraction procedures or the residues from mine-water treatment. These requests were handled on a case-by-case basis, and approvals were based on the interpretation that the proposed feed material was refined or processed ore." 57 Fed. Reg. 20525, 20532 (May 13, 1992).'**

Given the statements noted above and the fact that both ISR and conventional uranium recovery facilities utilize similar technology to strip uranium-laden IX resins, NRC already has demonstrated that such IX resins are acceptable for processing at ISR and conventional uranium recovery facilities if such facilities have IX stripping and elution facilities that are licensed by NRC or an Agreement State. *Since the receipt and processing of such IX resins has been acknowledged and assessed by NRC in the past, NMA believes that NRC should make clear in the ISR GEIS that both ISR and conventional uranium recovery facilities can accept uranium laden resins from ISR operators and/or other water treatment operators without the need for a license amendment.*" (emphasis added).

Thus, as stated in General Comment G, NMA believes that NRC should re-evaluate its exclusion of "toll milling" of uranium-loaded IX resins from alternative sources.

19. <u>Page 1-14, Lines 14-15</u>: The correct reference herein is Subtitle C of the Solid Waste Disposal Act (SWDA) which is the RCRA and is not related to the Safe Drinking Water Act (SDWA).

20. <u>Page 1-15, Lines 19-25</u>: NRC should be clear regarding the potential for Native American Tribes to exert regulatory authority over portions of ISR projects. Currently, the AEA, as amended by UMTRCA, does not permit Native American Tribes to assume Agreement State status through a Section 274 Agreement with NRC. As a result, Tribes are not permitted to regulate AEA materials or the licensed activities that recover or produce such materials as an "Agreement State." However, Native American Tribes are entitled to apply for "Treatment as a State" (TAS) status with EPA to obtain primacy over certain or all classes of wells under

the UIC program. NRC must be clear as to the delineation of authority over AEA materials and their associated licensed activities so that the lines of jurisdiction are drawn properly.

In addition, Section 1.6.2 refers to "local laws that impact ISL facilities." NRC should address the lines of jurisdiction referenced above in light of this statement and should be clear as to whether such local laws can infringe upon NRC's exclusive, preemptive jurisdiction over AEA materials and licensed activities such as ISR operations.

21. <u>Page 1-17, Lines 6-19</u>: Section 1.7.1 discusses the NRC licensing process for ISR facilities and glosses over the types of documents that are produced during the review of an ISR license application. NRC should be clear as to the following: (a) the names of the documents produced during an ISR license application review (e.g., EA or EIS, Safety Evaluation Report (SER), and license conditions) and (b) the targeted "goals" for production of such documents during such reviews depending upon availability of financial and human resources to give some sense of optimal timelines to potential license applicants, their investors, and other interested stakeholders. For example, NRC has a "goal" of ninety (90) days for completing so-called "acceptance reviews" of license applications and approximately twelve (12) months for completion of EAs. NRC should also state that such "goals" are merely "goals" and not hard-and-fast dates. In addition, NRC should make clear to interested stakeholders in its discussion of NRC's administrative hearing process that NRC Staff is empowered to issue an ISR license despite an ongoing administrative hearing.

22. <u>Page 1-19, Lines 19-21</u>: NRC needs to be clear as to the types of wells (i.e., extraction, injection, monitoring or deep disposal) at ISR sites that must receive a UIC permit(s). NMA believes that only site *injection* wells *are required* to meet Class III UIC requirements, while extraction and monitoring wells do not have to meet such requirements. Deep disposal wells which also result in the injection of fluids currently require a Class I UIC permit. However, the ISR GEIS should explain that many "primacy" States include extraction and monitoring wells in the definition of Class III wells, which is acceptable to EPA since it meets the SDWA's requirement of State UIC programs being "at least as stringent as" the federal program.

23. <u>Page 1-21, Lines 33-42</u>: In Section 1.7.3's discussion of BLM, NRC should avail itself of the opportunity to express its intent to work with BLM to create a more coordinated, "streamlined" approach to ISR licensing at sites implicating BLM jurisdiction. NRC also should address any other efforts to increase coordination with other federal/State agencies in the licensing process.

24. <u>Page 1-21, Lines 26-31</u>: NRC should check its weight reference to United States Department of Transportation (DOT) Type A packages (55-gallon drums) for

yellowcake. NMA believes that DOT regulations restrict the weight of Type A steel 55-gallon drums to 400 kilograms or 881.8 pounds.

25. Page 1-22, Lines 9-18: Section 1.7.4's discussion of the Navajo Nation's ban on uranium mining and milling raises the potential conflict between Tribal jurisdiction over Tribal lands and NRC's exclusive, preemptive authority over licensed uranium recovery (i.e., any process by which 11e.(2) byproduct material is created).[15] As stated previously, the Commission ruled in 2000 that the underground processes at an ISR facility effectively constitutes processing which is like "milling underground," thus subjecting health and safety issues associated with uranium recovery operations at an ISR facility to NRC's exclusive, preemptive AEA jurisdiction. The Navajo Nation ban raises a potential conflict here, because Tribal entities cannot obtain the authority to be an Agreement State under Section 274 of the AEA from NRC and, as such, cannot have any regulatory authority over the uranium recovery operations at an ISR site. NRC should explicitly clarify its jurisdictional authority over uranium recovery in light of the Navajo Nation ban so that there will not be any misperceptions regarding Navajo Nation authority to reverse or nullify NRC's AEA licensing authority.

26. Page 1-22: NRC should make clear that the grant of other necessary licenses/permits by other federal/State/Tribal agencies to conduct ISR operations (e.g., SDWA UIC permits, aquifer exemptions, etc.) is wholly independent of NRC's authority to license an ISR project under the AEA. As discussed in the aforementioned HRI administrative litigation, the pendency of a request for or failure to receive an aquifer exemption or UIC permit does not necessarily result in delay or denial of an NRC license.[16] However, typically, NRC mandatory license conditions for ISR sites require the licensee to have an aquifer exemption and a UIC permit before beginning active uranium recovery operations. Moreover, to begin ISR operations without these required SDWA authorizations would result in enforcement action by EPA or the "primacy" State for willful violation of SDWA requirements. NRC Staff has reiterated this position in various public meetings, but this position should be re-emphasized in the final ISR GEIS. NRC also should include more "positive" discussion about the additional public and environmental health and safety safeguards that these SDWA and other licenses/permits add to the already extensive safeguards inherent in an NRC license.

27. Page 1-24, Lines 12-16: Section 1.8 states that NRC is required under 10 CFR § 51.20(b)(8) to perform an EIS for ISR *license* applications. NRC should make clear that this requirement in 10 CFR § 51.20(b)(8) only applies to the issuance of *licenses* for ISR projects and not to the authorization of satellite wellfields linked to already existing ISR facilities, which typically requires a *license amendment*. 10 CFR Part 51.20 makes clear that certain agency actions require

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[15] *See* **10 CFR Part 40.4 (definition of "milling").**

[16] ***In the Matter of Hydro Resources, Inc.*** **(Crownpoint Uranium Project), CLI-04-14, 2004 NRC LEXIS 99 (May 20, 2004);** ***In the Matter of Hydro Resources, Inc.*** **(Crownpoint Uranium Project) 64 NRC 53 (August 21, 2006).**

EISs and specifically states what types of agency actions fall under the scope of the regulation. For example, while Subsection (b)(8) states "[i]ssuance of *a license*" and other Subsections refer to different agency actions (Subsection (b)(2) which states, "[i]ssuance or renewal of a full power or design capacity license" or Subsection (b)(12) which states "[i]ssuance of a license amendment pursuant to part 61 of this chapter"), NRC should be clear that the mandatory EIS requirement in Section 51.20(b)(8) only applies to issuance of a *license* and not a *license amendment* for source material milling operations, including ISR operations. This seems to be appropriate since, in NMA's view at the time of its promulgation, Part 51.20(b)(8) was wholly directed at conventional uranium mills, and it is, in fact, an ultra-conservative interpretation to apply it to ISR facilities based merely on the Commission's 2000 "milling underground" analogy. In addition, of course, the ISR GEIS is designed to fulfill this requirement for ISR projects and, thereby, to allow for "tiered" EAs for ISR projects.

28. Page 1-25, Lines 2-3: As stated in General Comment B, NRC should use more positive language to describe the substantial similarities between the surface and subsurface conditions and facilities at ISR project sites. The use of the term "relatively standard" does not explain adequately the significant similarities between facilities at ISR sites in each of the four identified regions or in any other regions as well. As stated previously, the complementary relationship between the natural subsurface conditions, the technological processes, and the regulatory controls at these project sites as described in NMA's GER (Chapter 5) should be emphasized as frequently as possible, including here.

29. Page 1-25, Lines 42-49: Section 1.8.2 should provide NRC's timeline "goal" for completion of the "acceptance review" pending available financial and human resources.

30. Page 1-26, Lines 17-26: NMA wholly endorses NRC's statement regarding "tiering" in Section 1.8.3. However, NMA believes that NRC should offer proposed timeline "goals" in this Section for completing environmental reviews, assuming preparation of a "tiered" EA and a FONSI.

31. Page 1-27, Lines 4-14: NRC should be clear on the time period to be offered for public comment on a "tiered" EA in Section 1.8.4. Additionally, in Sections 1.8.4 and 1.8.5, NRC needs to be clear that the 10 CFR Part 2 administrative hearing procedures used for ISR projects are "informal hearing" procedures and are not the same as the "formal" hearing procedures used for nuclear power reactors or the new hearing procedures for licensing Yucca Mountain.

C. CHAPTER TWO

32. Page 2-4, Lines 28-42 (Text Box): NRC's definition of yellowcake on this page states that yellowcake produced by most modern mills is brown to black and

not yellow. The color of yellowcake is dependent on the temperature at which the yellowcake is dried with higher temperatures resulting in darker colors. Yellowcake produced by modern vacuum dryers is indeed yellow.

33. Page 2-4, Lines 15-17: NRC needs to be much more region-specific in terms of where site pipelines are buried to protect them from freezing conditions. NRC should emphasize that burying pipelines is directly related to whether freezing of such pipelines would pose an occupational or public health risk and is to be evaluated on a site-specific basis. Typically, the freezing of pipelines is only an issue if operations have ceased and not when active operations are occurring. The concept that not burying pipelines may raise safety issues due to surface traffic or surface water flow is not consistent with standard practices in South Texas where burying pipelines is typically not required and pipelines run along the surface. Indeed, installing pipelines that are not buried due to weather conditions has the advantage of being less costly and easier to service in the event of leaks. Even though Texas is an Agreement State, it is likely that Agreement States will use the analysis in the ISR GEIS in their environmental reviews; so, it is important that NRC address the possibility that pipelines do not need to be buried for an ISR project to commence licensed operations safely.

34. Page 2-6, Lines 4-6: Section 2.2 is an excellent example of where NRC should avail itself of the opportunity to communicate to interested stakeholders that ISR projects are licensed, constructed, and operated in a "phased, iterative" process. This theme is echoed in the ISR SRP's Chapters 2 and 5 where NRC Staff discusses activities to be conducted prior to and after license issuance. The pre-construction phase (ISR Chapter 2, *Site Characterization*) embodies the activities that are required to obtain sufficient site-specific baseline information in support of a high-quality license application that is compliant with 10 CFR Part 40, Appendix A and applicable guidance. NRC should make it clear that much more site-specific data must be obtained *after issuance of a license* in order to properly conduct licensed ISR operations. With that said, NMA agrees that NRC's statement on Lines 22-26 is correct but the statements on Lines 28-29 are not. Thus, NMA, believes that NRC should revise this portion of its statement to emphasize that the ISR process involves considerable data gathering and analytical processes both before and after issuance of an NRC license, as articulated in the ISR SRP.

35. Page 2-7 & 2-8, Lines 27-34, Figure 2.3-1: NRC should provide more examples of potential wellfield patterns at potential ISR project sites. Providing interested stakeholders with one example of potential wellfield patterns incorrectly communicates to the public that this may be the only approach to ISR operations and could serve as grounds for a potential challenge to a specific license application proposing to use different wellfield patterns. NRC should make clear that the typical "five-spot pattern" is not the only approach to developing wellfields. NMA's GER at Chapter 2, Figures 2.6-2.10 provides other examples of potential wellfield patterns that can be used at ISR project sites, depending on site-specific conditions.

36. Page 2-15, Lines 26-47: Section 2.4 should include a clarification as to the "chemicals" that are used in the United States in any discussion of lixiviant chemistry. It would also be helpful to distinguish between the lixiviants routinely used outside of the United States versus the "soda-water-like" lixiviant used in the United States. ISR operators typically use oxygen, carbon dioxide, and/or sodium bicarbonate to fortify native groundwater which makes the lixiviant like "soda-water" for injection into a uranium ore body; however, some interested stakeholders have mischaracterized the extent of "chemicals" that are used in active operations. It is inappropriate to characterize the "chemicals" added to native groundwater in the same light as acids or other toxic/hazardous chemicals. This is an opportunity for NRC to communicate the essentially benign nature of ISR operations and the fact that ISR operators do not contaminate local groundwater. In addition, the lack of an evaluation in the DGEIS or in the final ISR GEIS of other ISR methodologies should not preclude future consideration of such methodologies in site-specific environmental reviews or the use of ISR GEIS analyses and conclusions, to the extent appropriate, in such reviews.

37. Page 2-18, Lines 13-15: As will be shown in the Glossary Section of the Specific Comments, NRC needs to ensure that the definition of the term "excursions" is correct and is consistent with its usage in the final ISR GEIS.

38. Page 2-19, Lines 12-50 (Text Box): NRC's "text box" on "excursions" makes a reference to the fact that NRC Staff approves excursion indicators and UCLs. In a sense, this is partially incorrect because, although NRC mandates the methods for choosing water quality parameters and the calculation method used to determine UCLs, since the advent of performance-based licensing as discussed in General Comment L above, it is the licensee's safety and environmental review panel (SERP) that actually approves final UCL values for monitor wells. The SERP approval is, of course, subject to NRC review and oversight.

NRC also states that UCLs are set on a wellfield basis. This is not always the case, since natural systems are involved and UCLs are set for each individual monitor well in a wellfield where baseline water quality varies significantly between monitor wells drilled in the same formation. Indeed, NRC should make the point frequently and where appropriate that there are naturally occurring variations in hydrological conditions between wellfields, as well as within wellfields, at any given site. NRC also needs to make clear that excursions can be identified in instances other than when UCLs for two indicators are exceeded. Some facilities have requirements where an excursion is identified when one indicator is exceeded at a monitor well by a certain percentage. NRC should be clear that these procedures to address excursions are imposed through site-specific license conditions as appropriate.

39. Page 2-19, Lines 4-6: NRC's discussion of wellfield spacing only includes spacing between wells and not the distances of perimeter monitor wells from the wellfield itself. Industry experience dictates that perimeter monitor wells

are located at approximately the same distances (300-500 feet) out from the wellfield itself.

40. Page 2-20, Lines 49-50: In Section 2.4.2.2, NRC states that the purpose of a sodium bicarbonate or bicarbonate rinse is to prevent uranium from precipitating in the elution vessel. This is incorrect as the purpose of the rinse is to place loaded resins in a bicarbonate state instead of a chloride state.

41. Page 2-20, Lines 41-44: Section 2.4.2.1 states that the ISR GEIS will discuss the potential impacts associated with the transportation of uranium-loaded IX resins to a central processing facility and Section 2.4.2.2 states that loaded resins can be eluted at a central processing facility from satellite wellfields. As noted above, NMA does not understand how NRC can exclude from an analysis of the potential environmental impacts of receiving and processing uranium-loaded IX resins the concept of "toll milling" of such resins from other ISR licensees or from licensees creating such resins through water treatment operations such as mine de-watering or drinking water treatment. For example, NMA's GER states:

> **"It is also worth noting that NRC's recent issuance of a source material license for R.M.D. Operations, LLC also assessed the transport of loaded IX resins from multiple community water systems (CWSs) to licensed uranium recovery facilities (conventional or ISR) for processing. Given that RMD's IX resins are substantially similar, if not identical to, ISR IX resins, this analysis should also be factored into NRC's assessment of transportation issues in the ISR GEIS."[17]**

It is NMA's position that loaded resins created during these activities are no different from resins produced from satellite wellfields or if there are differences, they should be evaluated because, inevitably, resins from such operations will be stripped at an ISR central processing facility or a conventional mill with similar capabilities. Indeed, ISR operations involve the removal of uranium from an identified water source in IX columns at a central processing facility or conventional mill with similar capabilities. The eventual stripping of these resins to produce yellowcake at a central processing facility is the same process regardless of where the resins originated. Thus, NMA reiterates that toll milling and processing of uranium-loaded resins from water treatment operations is not outside of the scope of the ISR GEIS.

42. Pages 2-18 through 2-20, Sections 2.4.1.3 & 2.4.1.4: NRC should clarify in this Section the location of the point of compliance (POC) and point of exposure (POE) at an ISR facility to enable license applicants to prepare adequate site-specific groundwater restoration plans. Concerns have been raised that NRC may be considering modifying its current approach to groundwater monitoring to move the POC to a location other than wellfield monitor wells. Such a change would be entirely inconsistent with 10 CFR Part 40, Appendix A's discussion of POCs and

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[17] NMA GER at Scoping Comments at 20, footnote 22.

the requirements for groundwater corrective action at uranium recovery facilities, either as currently applied per Commission policy via license conditions or as regulatory requirements. Appendix A sets forth a comprehensive program for groundwater corrective action at uranium recovery facilities. Specifically, Criterion 5(b)(1) sets forth the general requirements for establishing a groundwater monitoring program at uranium recovery facilities that includes establishment of a POC, of which NRC states:

> **"The objective in selecting the point of compliance *is to provide the earliest practicable warning* that the impoundment is releasing hazardous constituents to the ground water."**

Typically, at a conventional uranium mill and as stated in Criterion 5(B)(1), the POC is located at the downgradient edge of a tailings impoundment, while the POE is located at the uranium mill site's boundary. Then, as required, conventional mill licensees select specific groundwater quality parameters or indicators that typically migrate more quickly and/or are typically present in uranium mill tailings so that an "early warning system" may be established. Next, as required by Criterion 5(D), if a licensee detects an exceedance of groundwater monitoring parameters, such licensee is required to implement a groundwater corrective action program to return concentrations to background/baseline levels and such corrective action must continue until site groundwater is restored to such limits. However, only when a detection of these groundwater quality parameters is discovered is the licensee required to engage in groundwater corrective action. The Criterion 5 groundwater program has been in place for 25 years and has been consistently applied over such time period.

NRC's current approach to groundwater monitoring programs and excursions at ISR facilities, as discussed in the DGEIS and based on past practice, is entirely consistent with these Appendix A requirements. As stated in the DGEIS, NRC states that, "[l]icensees must maintain groundwater monitoring programs...to detect both vertical and horizontal excursions and must have operating procedures to analyze an excursion and determine how to remediate it." DGEIS at 2-18. As part of this mandatory groundwater monitoring program, NRC requires that licensees establish UCLs *at monitor wells* that, similar to a POC, are designed to "provide early warning if leaching solutions are moving away from the well fields." DGEIS at 2-19, Text Box. Similar to a conventional uranium mill, an ISR operator is also required to select "excursion indicators" that are "easily measurable parameters that are found in higher concentrations during ISL operations than in natural waters." After constructing its wellfield and commencing uranium recovery operations in that wellfield, a licensee is required to sample monitor wells on a pre-determined schedule to ensure that such indicators have not been impermissibly exceeded. In the event that site excursion indicators are impermissibly exceeded, NRC classifies such an exceedance as an "excursion." An "excursion" is defined in the DGEIS as "when two or more excursion indicators in a monitoring well exceed their UCLs." DGEIS at 2-19, Text Box. When an

excursion is detected, NRC requires that a licensee "take...several steps to notify NRC and confirm the excursion through additional and more frequent sampling" and recover the excursion. As a result, the monitor wells at an ISR site serve as the equivalent of a POC.

While the above discussion relates to groundwater monitoring programs during active operations, it is equally applicable to groundwater monitoring during restoration. The approach to groundwater monitoring at ISR facilities will not change as activities move from operation to restoration simply because excursions must be monitored during the entire ISR project lifecycle. Therefore, any attempt by NRC to require that the POC be at any location other than monitor wells is wholly inconsistent with Appendix A Criteria and current practices at ISR project sites. In the ISR GEIS, NRC should clarify that it will continue to apply its current practice of placing the POC at site wellfield monitor wells.

43. Page 2-26, Lines 11-32: NMA believes that NRC's discussion of aquifer restoration and its associated safeguards could be more detailed. First, NRC should reference the Commission's decision regarding the need for a RAP, as detailed in its 2000 decision in the HRI administrative litigation, either as a stand-alone document or as part of a license application in accordance with the ISR SRP. NRC Staff should reference the already-approved RAPs submitted by HRI for its Crownpoint Uranium Project (CUP) and the portions of the ISR SRP that apply to this issue.[18] Second, NRC should be clear as to the purpose of groundwater restoration, which is to minimize, if not eliminate, the potential for post-restoration excursions to adjacent, non-exempt aquifers and which is not to make a naturally contaminated water source that is unfit for human consumption into a drinking water source. This must be emphasized wherever possible so the purpose of groundwater restoration is thoroughly understood by all interested stakeholders.

44. Page 2-26, Lines 23-25: NRC should revise its Section 2.5 discussion of groundwater restoration to reflect the fact that restoration standards are not found in 10 CFR Part 40, Appendix A, as currently such standards are not applicable to ISR groundwater restoration until completion of the ongoing rulemaking regarding this issue. If NRC is to state that the ISR GEIS is written in light of regulations currently in existence at the time, then it should revise this discussion to state that Appendix A groundwater restoration standards are being imposed pursuant to Commission policy via license condition and not via Appendix A Criterion 5.

45. Page 2-27, Lines 4-27 (Text Box): Once again, NMA reiterates that NRC should be consistent with its Glossary on the definition and use of the term "pore volume" and "flare." The language used by NRC is the "text box" is not identical to the definition in the Glossary.

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[18] ***In the Matter Hydro Resources, Inc.*** **(Crownpoint Uranium Project), CLI-00-08, 51 NRC 227 (May 25, 2000).**

46. Page 2-27, Lines 8-13: NRC should revise Section 2.5.2's discussion of groundwater sweep to state that water is not pumped *from* injection wells during this activity unless a pump is installed to make it an extraction well.

47. Page 2-27, Lines 26-31: NRC should revise Section 2.5.2 to state that restoration fluids are passed through an IX unit separate from the central processing plant's IX units.

48. Page 2-27, Section 2.5.2: NRC's Section 2.5.2 discussion of the groundwater sweep should be revised to state that groundwater sweep is not always necessary depending on site-specific conditions. Groundwater transfer relies on the availability of a new wellfield being brought on line to receive transferred fluids and currently is deemed by industry experts to be somewhat questionable in terms of effectiveness. Groundwater sweep can use a substantial amount of water and have a minimal effect with respect to some constituents, including total dissolved solids (TDS). Thus, depending on site-specific conditions, both groundwater transfer and sweep may be skipped. However, NMA does agree that groundwater sweep and transfer are still potential options for groundwater restoration.

49. Page 2-28, Lines 19-20: Section 2.5.3 should be revised to state that sodium hydroxide "may" be added to groundwater to increase its pH during restoration.

50. Page 2-29, Lines 1-4: Section 2.5.3 needs to be revised to emphasize the highly site-specific nature of the number of pore volumes necessary for all aspects of groundwater restoration. While NRC cites to documents in this discussion of re-circulation of treated groundwater by reverse osmosis, it is not appropriate to state that "often more than 10 [pore volumes]"are required to achieve restoration goals as this is highly site and, perhaps, wellfield-specific. Indeed, there have been indications that this "treated" water from reverse osmosis treatment accelerates restoration as compared to groundwater sweep.

51. Page 2-29, Sections 2.5.3 & 2.5.4: NRC should include some discussion of the use of reductants and bioremediation as discussed in NMA's GER (Chapter 5, Section 5.3.3). The use of reductants may develop into an important technique for restoration depending on site-specific circumstances and, in light of NRC's release of a new NUREG on bioremediation (NUREG/CR-6973), a discussion of these issues is appropriate.[19]

52. Page 2-29, Section 2.5.4: Section 2.5.4 on "Stabilization" should be revised to reflect the fact that "stabilization," other than the sampling of baseline restoration wells, means that no activities take place during this stage since all the operator is trying to do is determine if the restored groundwater is "stable." Thus,

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[19] ***See also*** **EPA 402-R-05-007, *Technologically Enhanced Naturally Occurring Radioactive Materials from Uranium Mining-Volume I: Mining and Reclamation Background.***

the statement that the total volume and rate of net groundwater recovery during this phase would be similar to restoration is incorrect.

53. Page 2-29, Line 44: Section 2.5.4 should be revised to remove the term "permanently" from the sentence regarding sampling after stabilization to determine if pre-operational/baseline water quality parameters have been met. It is inappropriate to use the term "permanently" in this context because groundwater quality will vary over an extended period of time following restoration and stabilization. However, stabilization monitoring gives assurances that increasing trends will not exceed restoration standards and affect adjacent, non-exempt sources of drinking water in the future. But, as stated in NMA's GER, natural conditions at the project site which created the uranium deposit will return site groundwater back to pre-operational water quality standards over time.

54. Page 2-31 & 2-32, Section 2.6: Section 2.6's discussion of decommissioning and decontamination (D&D) should be revised to include the following:

a. NRC's estimate of 90 percent of D&D wastes being suitable for unrestricted release or disposal at a local landfill is somewhat optimistic. Generally, while items such as header houses can be readily decontaminated, items such as buried pipelines may be difficult to decontaminate and will require disposal as 11e.(2) byproduct material at a licensed facility. NRC should simply delineate the types of wastes that are created and their regulatory classification for purposes of final disposition;

b. Whether D&D wastes from the site can be disposed of at a local landfill is an important question that must be addressed because if they are wastes from uranium recovery operations, they would constitute 11e.(2) byproduct material and would have to be disposed of at a licensed facility. NRC needs to re-evaluate this statement in light of this fact;

c. On Page 2-31, NRC should be clear that wastes generated during site construction, such as drill cuttings, typically are considered to be technologically enhanced naturally occurring radioactive material (TENORM) rather than 11e.(2) byproduct material and, as such, are not subject to NRC's AEA jurisdiction. The issuance of an NRC license does not automatically render the wastes associated with construction to be 11e.(2) byproduct material because NMA believes that NRC"s AEA jurisdiction over "milling" does not begin until the "milling" operation commences (i.e., lixiviant is injected into the underground ore body).

55. Page 2-32, 8-11: Section 2.6 requires a more complete explanation of financial assurance, including clarification that Appendix A requires "financial assurance," one mechanism of which is a "surety bond." There continues to be confusion between financial assurance mechanisms (e.g., surety bonds, letters of credit, etc.) and the financial instruments used to assure that acceptable financial

assurance will be available if necessary (i.e., trusts and standby trusts). This statement should be revised accordingly because uranium recovery operators, including conventional uranium mills, often use mechanisms other than surety bonds such as parent company guarantees, letters of credit, and other acceptable Appendix A financial assurance mechanisms. Further, this section should have references to RAPs and relevant ISR SRP requirements on such RAPs.

56. Pages 2-32 & 2-34, Section 2.7.1: Section 2.7.1 has no data at all on radon emissions. Information on radon emissions, which have been identified as the most significant potential radiological threat to public health from ISR facilities, is necessary, because such emissions and their daughter products may pose a limited threat to workers depending on where exposure takes place (i.e., a confined area), although they have been found not to pose a significant threat to public health as a result of ISR operations.

57. Page 2-35, Section 2.7.2: Section 2.7.2 uses data from the Highland project for liquid waste stream constituents. NRC should consider using more updated data from projects such as the CUP or others to further substantiate this analysis.

58. Page 2-35-Figure 2.7-1: The abbreviation for "Relative Air Concentration" should be "sv/m^3" to depict sieverts.

59. Page 2-36, Lines 16-17: Section 2.7.2 should have some discussion of potential radium concentrations in liquid waste streams in the event water treatment to remove radium is pursued in lieu of other options. NMA's GER has sections discussing this issue (Chapter 4.1.4 & 4.1.13).

60. Page 2-36, Lines 19-23: Section 2.7.2 is another place where NRC should be clear about the types of liquid discharges that are permissible pursuant to an NPDES permit at ISR project sites in light of the Commission's 2000 decision regarding restoration fluids being 11e.(2) byproduct material.

61. Page 2-37, Lines 18-19: Section 2.7.2 states that NRC "may also review and approve deep will injection for a specific ISL site as a method to dispose of particular process fluids…." While it is true that it can approve a licensee's proposal to use deep-well injection to dispose of liquid wastes, NRC should revise the language to make it clear that NRC has no authority to approve a Class I deep-disposal well permit as such authority, currently resides with EPA and its SDWA "primacy" States.

62. Page 2-37, Lines 22-24: NRC should clarify its statement in Section 2.7.2 that aquifer water quality in a proposed Class I deep-well disposal area is "often" poor to reflect the fact that it is "always" poor or the disposal well likely would not be permitted.

63. Pages 2-37 through 2-39, Section 2.7.3, Table 2.8-1: As a general matter, NRC needs to be clear on the proper regulatory classification of and allowable disposition methods for varying types of solid wastes created at ISR project sites. NRC should refer to NMA's GER (Chapter Table 2.1) for more information:

a. Section 2.7.3's statement that "[s]olid wastes are classified as radioactive or non-radioactive…[and] [r]adioactive wastes are disposed of as 11e.(2) byproduct material…" is not necessarily correct in all cases. For example, some non-radioactive solid wastes, if created during uranium recovery operations, are considered to be 11e.(2) byproduct material. NRC needs to be clear as to when solid waste materials are to be classified as 11e.(2) byproduct material, so that all 11e.(2) byproduct material is properly disposed of at a licensed facility. To the extent that solid materials are wastes not directly associated with uranium recovery operations or are not wastes because they have been sufficiently decontaminated for other uses, such solid materials would not be classified as 11e.(2) byproduct material;

b. The most common hazardous waste produced and regulated under RCRA is universal waste (e.g., spent fluorescent tubes, batteries, and oil). Most facilities will be conditionally exempt small quantity generators.

64. Page 2-38, Line 32: NRC should include the (Finch, 2007) regarding satellite wellfields and the operational processes associated with such wellfields in the reference guide at the end of the Chapter.

65. Page 2-38, Lines 22-38: The Section 2.8 discussion of transportation impacts from satellite wellfields is further evidence that the potential environmental impacts, if any, from "toll milling" and processing of uranium-loaded IX resins from other water treatment operations should be considered to be within the scope of the ISR GEIS.

66. Page 2-38, Lines 40-48: NMA reiterates its question on DOT regulations for Type A steel 55-gallon drums from Specific Comment #24.

67. Page 2-40, Lines 6-14: NMA reiterates the need to have further discussion of permitted effluent discharges under 10 CFR Part 20 and NPDES permits;

68. Page 2-41, Lines 8-14: Section 2.9 should be revised to reflect the lack of necessity for radon flux measurements under Regulatory Guide 4.14 because ISR facilities do not have tailings piles or impoundments. NRC should consider revising Reg. Guide 4.14 in light of this or to specifically inform licensees as to why radon flux measurements are not necessary at an ISR facility, unless, of course, EPA decides to require some form of flux measurement at evaporation ponds pursuant to 40 CFR Part 61, Subpart W under its Clean Air Act (CAA) authority (a proposition with which NMA, and presumably NRC, emphatically disagree).

69. Page 2-41, Section 2.10: NRC should revise Section 2.10 to include more discussion of the role of financial assurance at ISR project sites which is to ensure that adequate funds are available to complete site D&D, including appropriate groundwater restoration, in the event that the licensee is unable to do so. NMA's GER has a specific discussion of this (Preamble-xxvii, Chapter 5, Section 5.3).

70. Page 2-41, Lines 45-46: NRC needs to revise its statement that a third-party contractor not affiliated with the applicant/licensee must calculate the financial assurance cost estimates. NRC is required to approve a financial assurance cost estimate from an applicant/licensee, but the applicant/licensee is not required to obtain a proposed cost estimate calculated by an independent contractor; but rather is required to provide calculations for a final financial assurance cost estimate with appropriate data to support its conclusions (e.g., equipment cost information or local contractor bids etc.). NRC's review takes into account that site D&D may have to be performed by an independent contractor pursuant to Appendix A. Criterion 9, but NRC's regulations *do not* require that an independent contractor prepare the financial assurance cost estimates for the applicant/licensee.

71. Page 2-42, Lines 12-14: NRC needs to retract its statement that availability of site equipment and site personnel performing multiple, unrelated tasks cannot be taken into account when determining financial assurance cost estimates as this is in direct conflict with the Commission's determination in the HRI administrative litigation that such items can be used when calculating such cost estimates.[20] NRC Staff is not empowered to alter Commission policy without express endorsement of the Commission.

72. Page 2-44, Table 2.11-2: NRC should revise this Table to reflect that sodium hydroxide also may be used as a 50 percent liquid concentration and not just in a dry state. This Table should also include items such as sodium sulfide (dry), hydrogen sulfide, barium chloride, and gasoline.

73. Page 2-46, Section 2.11.3: NRC needs to be clearer in Section 2.11.3 as to the difference between groundwater consumption rate and total production rate. All license applications are required to have water balance that shows the consumption rate during operations and restoration. NRC likely can find this data in license applications recently submitted by Power Resources, Inc. (PRI), Ur-Energy, Uranium One/Energy Metals, etc.

74. Pages 2-46 & 2-47, Section 2.11.4: NRC should use positive language to emphasize the effectiveness of MITs as an effective safeguard against site leaks. NRC also should refer to NMA's GER (Chapter 5, Section 5.3.2) which indicates that some problems with leaks in wellfields in the early days of ISR activities essentially have been eradicated due to MITs.

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[20] *In the Matter of Hydro Resources, Inc.* (Crownpoint Uranium Project), CLI-04-33, 60 NRC 581 (December 8, 2004).

75. Pages 2-46 & 2-47, Section 2.11.4: NRC needs to be consistent when it discusses excursions at existing ISR facilities so as not to convey the wrong message to interested stakeholders. For example, NRC needs to place excursions at the site discussed in their proper context, because excursions that have been identified as "long-term" excursions will be remediated when adjacent mine units complete restoration. NRC also states that horizontal excursions can be remedied by fixing or re-conditioning wells, but this actually refers to vertical excursions. Horizontal excursions cannot be fixed this way; but rather can be fixed by re-adjusting the wellfield balance. Additionally, different regulatory regimes have different approaches to determining whether an excursion has occurred, so NRC should start any discussion of placing a well on excursion status by stating what the *typical* conditions are for doing so. In simplest terms, an excursion provides early warning of a problem(s) in a wellfield by the arrival at a monitor well of highly mobile and typically non-hazardous excursion indicators which do not include uranium and radium or other heavy metals of concern. NRC must be sure to convey the proper message when referring to excursions, which appear to be a sensitive issue for interested stakeholders.

D. CHAPTER THREE

76. Page 3.1-1, Lines 41-43: NRC should provide additional clarity to the discussion in Section 3.1.1 regarding the application of the ISR GEIS to project sites that may be outside the four identified regions. NRC should state that any potential license application for a proposed ISR project outside the four identified regions *will* be able to utilize the ISR GEIS' analyses and conclusions to the extent practicable and will be able to avail itself of a "tiered" EA if the ISR GEIS' application to the proposed project site is consistent with its application to the four identified regions. NRC should also state that all identified regions are "reasonably bound" to include all potential project development areas, because the ISR GEIS evaluates the potential impacts of relatively standardized technology used to recover uranium from generally similar subsurface deposits.

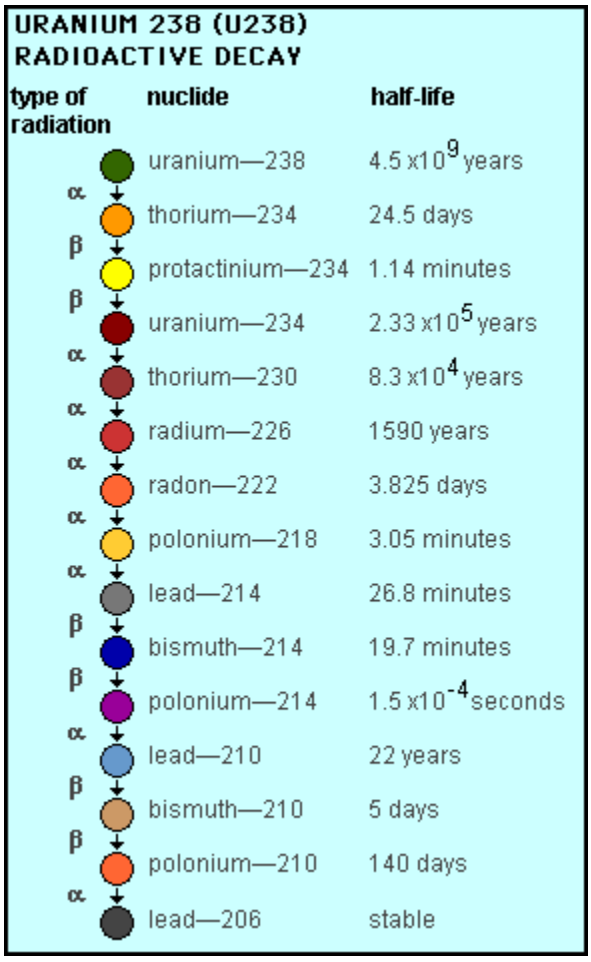
77. Page 3.1-4, Figure 3.1-3: NRC should note that its discussion of the southern boundary of the Nebraska Region does not currently include potential expansion areas for Crow Butte Resources such as Marsland, Nebraska. NMA believes that this area should be included to reflect a more complete picture of this region.

78. Page 3.2-4, Table 3.2-1: As stated in General Comment H, NRC needs to be clear on the difference between uranium "mining" and "milling," due to potential jurisdictional conflicts and the significant differences in potential impacts associated with each activity. This factor is crucial to a proper understanding of land use, cumulative, and other impacts associated with each activity.

79. Page 3.2-20, Line 19: Line 19 misquotes the source on the flow rates from the uranium-bearing aquifers. The source should have been quoted to say 200-1,000 gpm.

80. Page 3.2-21, Lines 10-13: It is absolutely imperative that NRC include more data regarding *radon* in water concentrations both within and outside exempted aquifers where identified uranium deposits are located when discussing groundwater quality. While uranium and/or radium concentrations typically exceed EPA's MCLs in a given recovery zone, radon in water concentrations can be extremely large in relation to EPA's previously proposed MCL for radon in water of 300 picocuries/liter (pCi/l) (e.g., up to 1,000,000 or more pCi/l radon in recovery zone groundwater). Such information will help to dispel inaccurate assertions that pre-operational water can be a *pristine* water source. Certainly, given well-documented concerns regarding radon exposure impacts to underground uranium miners, it would be considered unsafe to bring radon from groundwater sources with high natural concentrations into the home via a water pathway.

81. Page 3.2-81, Lines 18-42: NRC needs to include a more detailed discussion of the decay chain from uranium-238 to radium-226 to radon-222 in Section 3.2.11.1 and 3.2.11.2, because, as stated previously, radon has been identified as posing the most significant potential occupational and public dose risk at ISR project sites. The lack of a detailed discussion of this issue diminishes the effectiveness of NRC's analysis of potential impacts to workers and the general public from radon and does not provide a solid foundation upon which to base an applicant's ER. NRC should consider using the following diagram in the discussion:



82. <u>Page 3.2-81, Lines 31-35</u>: NRC should supplement its statement regarding TENORM being outside the scope of NRC's jurisdiction and part of background radiation for dose calculation (total effective dose equivalent (TEDE)) purposes with a citation to the Commission's decision in the HRI administrative litigation.[21]

83. <u>Pages 3.3-18 & 3.4-27, Sections 3.3.4.3.3 & 3.4.4.3.3</u>: Sections 3.3.4.3.3 and 3.4.4.3.3 also require a more detailed discussion of radon concentrations in pre-operational site groundwater both inside and outside the exempted aquifer area to give a more thorough and accurate picture of the reason the recovery zone portion of the aquifer can never be a public drinking water source.

84. <u>Page 3.5-1, Section 3.5.1</u>: NRC should ensure that its discussions of land use impacts and potential contamination of water supplies is sensitive to the particular issues associated with land ownership status frequently raised in the New Mexico region. The recent "Indian country" issue raised with respect to HRI's proposed ISR project site at Section 8 in Church Rock, New Mexico and the potential impacts of litigation addressing such issues, the recent Navajo Nation ban

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[21] ***In the Matter of Hydro Resources, Inc.*** **(Crownpoint Uranium Project), CLI-06-14, 63 NRC 510 (May 16, 2006).**

on uranium mining and milling, and potential "takings" claims as a result is a good example of how land ownership status should be placed in the proper context by NRC in its description of the region. Thus, NRC should ensure that its description of the region takes into account the "checkerboard" nature of land ownership of the region and the potential issues that may be raised with respect to jurisdiction over issuance of NRC licenses for ISR operations.

85. Page 3.5-19, Section 3.5.4.3.2: NRC needs to communicate to interested stakeholders that large regional aquifers contain isolated, ISR-amenable, roll-front uranium deposits which, due to the redox-based "geochemical trap" that causes uranium to precipitate out, leaves other downgradient portions of the same aquifer available to citizens to use as a water source for various purposes, including drinking water. Statements such as those in Section 3.5.4.3.2 that uranium-bearing aquifers such as the Westwater Canyon aquifer are vital to water supplies needs to be qualified to reflect the fact that regional aquifers typically are large enough to contain ISR-amenable uranium deposits that, due to regional redox "geochemical trap" conditions, are effectively isolated from other portions of the aquifer that can be used for drinking water. This is common sense because the primary purpose of groundwater restoration is to minimize, if not eliminate, the potential for post-restoration migration of recovery solutions to *adjacent, non exempt aquifers or portions thereof*. NMA's GER (Chapter 5, Section 5.3) provides a detailed discussion of this issue.

86. Page 3.5-20, Lines 41-48: In accordance with Specific Comment #74 above, NRC must discuss the water quality in Crownpoint in Section 3.5.4.3.3 to reflect the "localized" conditions in portions of the regional aquifer which *can be or have been exempted* for uranium recovery purposes. Limiting the discussion to "regional" water quality" does not account for the isolated uranium deposits located in portions of the regional aquifer in the Crownpoint area and described in HRI's CUP license application, which are not and cannot be used for public drinking water purposes. NRC should refer to that license application and NMA's GER for additional information on this issue.

87. Pages 3.5-52-55, Sections 3.5.8.3 & 3.5.8.4: NRC should provide a general discussion of the statutory and regulatory safeguards available under NRC regulations and other regulatory regimes that protect historic and cultural resources during the course of the ISR project lifecycle, including sample license conditions. The Commission's decisions in the HRI litigation affirm the *phased*, iterative process under the NHPA and NRC license conditions to protect and preserve historic and cultural resources.[22]

Additionally, NRC should include a discussion of Mt. Taylor and its surrounding land areas in Section 3.5.8.3 and 3.5.8.4 with respect to its relationship

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[22] ***In the Matter of Hydro Resources, Inc.*** **(Crownpoint Uranium Project), CLI-06-11, 63 NRC 483 (April 3, 2006);** ***In the Matter of Hydro Resources, Inc.*** **(Crownpoint Uranium Project), 62 NRC 442 (September 16, 2005).**

to National Historic Preservation Act (NHPA) regulations and NRC license conditions. Whether Mt. Taylor and its surrounding land areas warrant special protection is a sensitive issue, but an issue that still must be addressed in light of existing law and regulations. While it is important to protect historic and cultural resources adequately, the manner and means by which a regulatory entity does so is site-specific and, by no means, can be considered to automatically impose or prohibit uranium recovery.

88. Page 3.5-59, Section 3.5.8.4: In Section 3.5.8.4, NRC needs to provide an explanation for the statement that traditional cultural landscapes in the New Mexico region are playing an increasing role in management's decision-making process. The current discussion appears to be tailored towards "political correctness" and does not provide any statutory or regulatory basis for such a statement. Currently, it does not appear that NRC's statutory authority and existing regulatory program allow for unilateral extension of the scope in its decision-making processes regarding properties and resources potentially requiring protection. In any event, NRC must provide a discussion of the role that mitigation measures can and do play in that decision-making process.

E. CHAPTER FOUR

89. General Chapter Comment: NRC appears to overstate the potential for adverse impacts associated with ISR operations in each of the four identified ISR regions. NRC should review NMA's GER and adjust the tone of its statements to be more in line with the relatively low impacts of ISR operations and the fact that ISR is the lowest risk activity in the nuclear fuel cycle.

90. Page 4.2-1, Section 4.2.1: As discussed in Specific Comment #1, NRC has included ecological, cultural, and historic resources in its analysis of land use impacts in the Wyoming West region. These items are also included throughout the Chapter when analyzing the potential land use impacts associated with the other three identified ISR regions. This approach appears to contradict the guidance in Chapter 2 of the ISR SRP and Chapters 5 and 6 in NUREG-1748 and should be re-evaluated as the range of potential impacts of land use are minimal at ISR project sites and the proposed range of potential impacts to cultural and historic resources (SMALL to LARGE) is unreasonably broad and could be affected by removing such items from land use and re-classifying them.

91. Page 4.2-6, Lines 31-35: NRC should review DOT regulations at 49 CFR § 178.504(b)(9) to determine whether its reference to a yellowcake drum shipment weight of 950 pounds is correct. NMA believes that this regulation limits the drum shipment weight limit is 881.8 pounds or 400 kilograms.

92. Page 4.2-7, Lines 33-44: NRC's discussion on IX resin transport should be supplemented using information from the recent R.M.D. Operations, LLC license, ER, and EA. This information provides additional support for including the

transport of uranium-loaded IX resins from water treatment project sites to central processing facilities for uranium recovery.

93. Page 4.2-8, Section 4.2.2.3: NMA does not understand why transportation of chemical shipments during aquifer restoration as described in Section 4.2.2.3 results in SMALL TO MODERATE potential impacts when other potential impacts from transportation are rated as SMALL. To the best of NMA's knowledge, there are no chemical shipments solely associated with aquifer restoration.

94. Page 4.2-10, Lines 15-16: Section 4.2.3.2's statement that the removal of uranium from uranium ore bodies "will result in a *permanent* change to the composition of uranium-bearing rock formations" can be read to imply the potential for significant impacts when no such impacts will occur. NRC must be careful to not convey to interested stakeholders that ISR operations could result in significant, *permanent* impacts to aspects of site geology or any other aspects of the site.

95. Page 4.2-11, Lines 31-40: In Section 4.2.3.2, NRC needs to revise its statement regarding treatment of wastewater prior to discharge to evaporation ponds. Industry experience demonstrates that, more recently, treatment of such wastewater does not necessarily occur in all cases at ISR project sites. Given that ISR licensees are required to reclaim evaporation ponds at the end of site operations and to dispose of the resulting solid material as 11e.(2) byproduct material at a licensed facility, some ISR licensees may decide not to treat the wastewater prior to discharge to an evaporation pond or deep-disposal well.

96. Page 4.2-11, Lines 42-50: NRC should include an explanation and example in Section 4.2.3.2 of the State requirements applicable to release limits for non-radiological constituents. The question is whether any such requirements are relevant to the use of land application for 11e.(2) byproduct material wastewater streams containing non-radiological constituents in light of the Commission's policy that production bleed and restoration fluids both are 11e.(2) byproduct material and the potential preemption issues associated with the Commission's AEA jurisdiction over uranium recovery.

97. Page 4.2-15, Lines 29-36: NRC's statement in Section 4.2.4.1.1 regarding temporary discharges of wastewater from sites under a State discharge permit raises the same jurisdictional issues discussion as stated in Specific Comment #5 above. There may be a difference between the classification of discharges of water recovered from pump test wells, depending on whether the discharge is prior to active uranium recovery operations (i.e., during site characterization) or after such operations commence.

98. Page 4.2-16, Lines 2-14: See Specific Comment #5 on applicability of NPDES permits to discharges of production or restoration liquids from ISR project sites.

99. Page 4.2-20, Lines 7-38: NRC's use of a scenario in which drawdown from a well in the Wyoming West Region is calculated using hypothetical measurements of one, ten and one hundred feet down from a single well over a ten year period does not provide any useful information regarding site-specific well drawdown figures. NRC should have sufficient data from its prior licensing experience in this region to determine what the range of potential drawdown in wells in the region would be. NRC should refer to licensed sites in the region and license applications that have been submitted to provide a more accurate assessment.

100. Page 4.2-20, Lines 26-38: See General Comment C on imposition of groundwater restoration standards as "goals" through license conditions per Commission policy and not as hard-and-fast standards.

101. Page 4.2-23, Lines 17-19: NRC should revise its statement in Section 4.2.4.2.2.2 on "Excursions and Groundwater Quality" regarding the placement of the Green River Formation in the Lost Creek area to reflect the fact that the Formation is not located above the area's uranium-bearing aquifer, but rather is not found in that area. In truth, the Battle Spring Formation outcrops at the surface with no other overlying formations.

102. Page 4.2-24, Lines 44-49: See Specific Comment #47 regarding groundwater transfer as an optional step in the restoration process.

103. Page 4.2-26, Lines 33-37: NRC needs to be clear in its discussion of potential groundwater impacts to differentiate between the terms "pre-operational baseline" and "pre-operational class-of-use," as the two are not necessarily synonymous as restoration "goals."

104. Page 4.2-27, Lines 8-10: NRC correctly states in Section 4.2.4.2.4 that wells will be plugged in accordance with WDEQ UIC requirements, but it should refrain from discussing specific well plugging techniques as they will be highly site-specific and, potentially, State-specific.

105. Page 4.2-29, Line 23: NRC's Section 4.2.5.1 on wildlife fails to characterize potential impacts to wildlife as SMALL to MODERATE as stated on Page 4.3-19.

106. Page 4.2-32, Lines 43-44: In Section 4.2.5.2, NRC should be careful not to express that netting over ponds to prevent access by birds is a mandatory requirement as, to the best of NMA's knowledge, the licensees in Nebraska and Wyoming do not use nets because the ponds have extremely salty water and the local birds tend to avoid them. NRC should state this is a requirement that would be imposed only on a site-specific basis, if necessary.

107. Page 4.2-33, Section 4.2.6: NRC needs to re-evaluate its assessment of air quality impacts which only seem to encompass *non*-radiological air emissions and do not include radiological air emissions. NRC's assessment should reflect the discussion format offered by NMA in its GER to make the assessment more "user-friendly." This issue was specifically litigated in the HRI administrative proceeding and discussed in NMA's GER (Preamble, P-xxvii).

108. Page 4.2-42, Section 4.2.8: See General Comment K on the value of sample license conditions.

109. Page 4.2-43, Section 4.2.8.1: In Section 4.2.8, NRC should include a discussion of the imposition of specific license conditions which mandate ongoing licensee responsibility with respect to expanding a site footprint and its potential impacts to historic and cultural resources. See General Comment K on the value of sample license condition language.

110. Page 4.2-52, Section 4.2.11.2: Section 4.2.11.2 needs to have references to and a discussion of 40 CFR Part 190 with respect to yellowcake air emissions. NRC should also make clear that potential radiological impacts from direct gamma radiation are not air quality (dose) issues as alleged by opposition parties in the HRI litigation and, either here or elsewhere, NRC should explain that public exposure to direct gamma radiation is likely to be zero since two key requirements for there to be gamma exposure (i.e., proximity to the source and the duration of exposure) essentially will be eliminated due to lack of routine public access to wellfields or central processing facilities. Historical data collected at ISR facility boundary monitoring locations, which are accessible to the public, consistently have shown direct radiation levels that are indistinguishable from background.

111. Page 4.2-54, Lines 29-31: Section 4.2.11.2.2's statement that a site worker could receive over 5 rem of dose[23] if he/she did not evacuate the facility after a thickener spill quickly enough is unrealistic and should be re-assessed. First, the yellowcake in a thickener is in a slurry form and is not subject to becoming airborne. Second, the yellowcake slurry is an alpha emitter which is too weak a dose source to penetrate human skin and provides no dose as long as it is not ingested. Thus, since the slurry will not become airborne and create a breathable aerosol, the only exposure pathway is for the employee to eat the slurry which is highly unlikely. Even if the employee ate the slurry, they would have to eat a large quantity to receive a dose in excess of 5 rem. Therefore, NRC should consult NMA's GER (Chapter 4, Section 4-26) and re-assess this statement.

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[23] This scenario appears to be taken from NUREG/CR-6733 entitled *A Baseline Risk-Informed, Performance-Based Approach for In Situ Leach Uranium Extraction Licensees*, (September, 2001) at 4-16, 4-17, 4-31 through 4-35 which NMA believes is ultra-conservative and unrealistic given the fundamental realities of ISR operations, as noted above.

112. Page 4.2-55, Lines 12-15: Section 4.2.11.2.2's discussion of an employee receiving a dose of 8.8 rem[24] if a yellowcake dryer explodes also is unrealistic. This calculated exposure is unrealistic, because the hypothetical employee would be wearing personal protective equipment in the form of a respirator and the yellowcake would settle out of the air quickly enough that an insufficient amount could be ingested to cause such a large dose. If NRC is to make this statement, then there needs to be some case-specific data and analysis.

F. VOLUME II: EXECUTIVE SUMMARY

113. Page xxxiv: Once again, NMA reiterates its Specific Comment #11 addressing the announced policy regarding conventional mill or heap leach re-starts.

114. Page xli: As discussed in General Comment C, when discussing the statistical range of baseline water quality values, NRC should be clear to state that typical industry practice is to seek to restore site groundwater "consistent with" pre-operational/baseline water quality standards that should include some statistically relevant a margin of error. This fact should be cited throughout all discussions of restoration in the ISR GEIS.[25]

115. Page xli: NRC needs to be clear regarding the differences between drawdown during restoration as compared with that of operations. See Specific Comment #4.

116 Page xliv: In the Operations section, NRC needs to put in specific statements regarding the minimization of potential impacts to workers from site radon emissions therein due to ventilation requirements in structures and the virtual elimination of radon emissions where down-flow pressurized IX columns are used. Ventilation is specifically intended to reduce potential radon daughter "buildup" at a site, while down-flow pressurized IX columns force the radon back into the groundwater.

117. Page xlvi: In the discussion of Historical and Cultural Resources Impacts, NRC should include specific discussion of the use of license conditions to impose a continuing obligation on the part of licensees to identify and protect previously unidentified historic and cultural resources during the course of site construction, operations, and decommissioning. This requirement is the result of NRC's implementation of NHPA requirements and can be found in a variety of existing ISR licenses and the HRI administrative litigation record.

118. Page xlviii-ix: NRC should discuss potential occupational and public radiological impacts in the context of 40 CFR Part 190 regulations and the

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[24] *See* **Footnote #23.**
[25] *See e.g.,* **ISR SRP at Section 5.7.8.3.**

discussion addressing radon settlement needs to be amended to address *radium* settlement.

G. CHAPTER SIX

119. Page 6-1, General Chapter Comment: NMA agrees with NRC's use of census data as it relates to environmental justice (EJ) and other socioeconomic issues to be evaluated.

120. Page 6-2, Lines 24-31: NMA agrees with NRC's statement regarding EJ that the existence of no significant impacts means that there can be no disproportionate impacts.

121. Page 6-4, Lines 1-3: NMA believes that NRC's use of a fifty mile radius to evaluate demographic and socioeconomic data is not justifiable because, as NRC has stated, ISR operations generally have extremely low and localized impacts. Indeed, there has been no history of significant impacts from ISR projects operated over the past thirty years in the United States. Further, NUREG-1748 specifically recommends a four (4) mile radius for ISR projects at rural sites and also discussed in a footnote why the use of a fifty mile radius is not warranted.[26] Therefore, NRC should reduce the scope of this evaluation to 4 miles.

122. Page 6-13-18, Sections 6.2, 6.3, 6.4, & 6.5: NMA does not understand why the discussion of EJ suggests the need to assess the potential public or occupational radiological impacts in the Wyoming West, Nebraska, and New Mexico regions when potential impacts to workers are the same at all sites and such potential impacts to members of the public are essentially zero beyond the site's fence-line at all sites. NRC should revise its statements on these pages to reflect these facts.

123. Page 6-16 & 6-17, Lines 37-46: NMA believes that NRC's conclusion that there are EJ land use issues in the "checkerboard" region is incorrect. The purpose of environmental justice is to evaluate disproportionate impacts and, in the case of ISR operations, the location of the ore body determines the location of the facility and land use impacts are as NRC has noted in the DGEIS, limited in nature and duration; so, there are no disproportionate impacts caused by the decision to place an ISR facility in low-income, low-cost area.

124. Page 6-19, Lines 3-33: NMA does not believe that the conclusions of this Chapter, as summarized in Section 6.6, are supported by the data and analyses regarding resource areas potentially requiring site-specific EJ analyses (e.g., potential radiological impacts, which are virtually non-existent, are the same for general or environmental justice populations). The "sensitivity" of some Native Americans to potential radiological impacts does not change the facts and, therefore, should not require additional site-specific analyses.

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[26] *See* NUREG-1748 at C-4.

H. CHAPTER SEVEN

125. Page 7-1, Lines 13-36 (Text Box): NRC needs to revise this section to defer to the standard industry and regulatory terms for these items that have been used in the past or, at the very least, include such terms in its analysis. Typically, industry uses the term SOP to describe the procedures and operational controls utilized by licensees during all phases of the ISR project lifecycle. NRC traditionally imposes requirements for best management practices and other necessary requirements (which frequently are consistent with licensee SOPs) through the use of "license conditions," in many cases, because the existing regulatory framework for uranium recovery (10 CFR Part 40) was originally intended to apply to conventional uranium mills. However, an ongoing rulemaking at NRC is intended to tailor aspects of this regulatory program to ISR restoration operations. But, NRC should make clear that currently most of its regulatory control requirements are imposed through license conditions so that the ISR GEIS' analysis is more easily understood by interested stakeholders.

126. Page 7-5, Table 7.4-1: NRC should mention the use of and benefits from down-flow pressurized IX columns in its discussion of potential occupational and public health and safety impacts from radon.

I. CHAPTER EIGHT

127. Page 8-2, Lines 14-15: This appears to be the first mention of 40 CFR Part 190 in the ISR GEIS. NRC should be sure to include further references in this document as appropriate as stated previously in NMA's General and Specific Comments.

128. Page 8-3, Section 8.3.1.1: NMA reiterates it previous General Comment D regarding the need for emphasis of the "phased, iterative" nature of ISR projects as demonstrated by differences between Chapters 2 and 5 of the ISR SRP.

129. Page 8-6, Lines 30-32: NRC's statement regarding requirements to cease active operations within sixty (60) days if remediation of an excursion is not complete should be revised to be more license and/or State-specific. The ISR GEIS should qualify this statement to reflect the fact that this requirement frequently is based on the time period articulated by the project site's resident State. In addition, most states dictate that if an excursion cannot be controlled within a defined time period that the injection of recovery solutions "in the vicinity of the excursion" must be ceased and not all injection of such solutions everywhere at the site. Thus, if this statement is not revised, it could be interpreted to mean that *all* injection must be stopped in the event an excursion occurs and is not controlled within sixty days, which may be incorrect.

J. CHAPTER TEN

130. Page 10-3, Table 10-1: NRC needs to continue to emphasize the relatively small and dispersed site footprint of wells in wellfields at ISR operations, as a result, NMA believes that referring to potential land use impacts as SMALL to LARGE is overly broad and significantly overstates the range of potential impacts including specifically those regarding cultural and historic resources. Additionally, under NRC license conditions and licensee SOPs, historic preservation responsibilities are not static but rather are ongoing throughout the entire life of the project.

L. CHAPTER TWELVE: GLOSSARY

131. Page 12-1 (Glossary): As stated in General Comment I, NRC must review the definitions of specific terms in the Glossary and cross-reference them with appropriate "text boxes" or other places in the DGEIS wherein they are defined or used to ensure that they are identical:

a. "Agreement State" should be revised to reflect the fact that uranium recovery authority must be explicit in any Section 274 Agreement for NRC to relinquish active oversight over such materials and activities to the State and to reflect that Tribes are not permitted to enter into a Section 274 Agreement with NRC under the AEA;

b. "Aquifer Exemption" should be revised to reflect that EPA must approve all aquifer exemptions, even those in States with "primacy;"

c. "Aquiclude" should be revised to state that these formations confine groundwater within an *exempted* aquifer or portion thereof;

d. "Byproduct Material" should use the definition from the AEA to ensure compatibility;

e. "Conventional Uranium Milling" should be revised to state:

> **"A chemical process used to extract uranium from uranium-*bearing* ore. At conventional uranium mills, the ore *typically* arrives via truck and is *typically* crushed and chemically leached with sulfuric acid or alkaline solutions to remove about 90 to 95 percent of the uranium. NRC regulates the milling process (after ore enters the mill *site*), but other agencies regulate the mining processes used to extract the ore."**

This modification is necessary because "uranium-bearing ores" include alternate feed materials per the Commission's mandated definition of "ore." NMA does not believe that NRC should be clear that the definition of "ore," as discussed below, requires that the definition of "conventional uranium milling" be modified;

f. "Excursion" should be revised to comport with the definition used in Chapter 2 and note that sites have different requirements such as two indicators exceeding their UCLs and/or one indicator exceeding its UCL by a certain percentage;

g. "Flare" should be revised to reflect its definition in Chapter 2;

h. "Lixiviant" should be revised to reflect its usage in Chapter 2;

i. "Mechanical Integrity Test" definition should be added to the Glossary and should discuss the type of wells to which it is applicable;

j. "Mill Feed" should be revised to include uranium-loaded IX resins and yellowcake slurry;

k. "Ore" should be revised to reflect the Commission's definition of "ore" as reflected in the Alternate Feed Guidance. This definition was mandated by the Commission and the ISR GEIS should not attempt alter it in the face of the Commission's decision. This is especially important as ISR licensees likely will be seeking NRC authorization to receive and process ore in the form of uranium-loaded IX resins created as a result of a variety of water treatment operations in the near and distant future. See General Comment G & Specific Comment #41 on this issue;

l. "Performance-Based Licensing" should be added to the Glossary and should reflect the fact that performance-based licensing, as opposed to conventional prescriptive licensing, is designed to minimize the amount of active regulatory oversight over a licensed activity by providing "performance" criteria or requirements for licensees while, at the same time, assuring that public health and safety will be protected adequately.

m. "Pore Volume" should be revised to comport with its definition in Chapter 2;

n. "Radon" should be revised to include exposure to radon *and radon progeny/daughters* since it is widely understood that exposure to radon itself does not pose a significant potential public health hazard; rather it is the *progeny/ daughters* that pose the potential threat in a confined space;

o. "Restoration" should be revised to reflect the part of the ISR project lifecycle during which this activity occurs (i.e., D&D of depleted wellfields) and that portion of NRC's regulatory regime that imposes such a requirement (i.e., per Commission policy, Criterion 5(b)(5) through license conditions which, currently, does not include pre-operational class-of-use). NRC should state that the purpose of restoration is to restore reductive conditions in the recovery zone in order to minimize or eliminate post-restoration migration of recovery fluids to adjacent,

non-exempt aquifers, or portions thereof, and not to create a drinking or other class-of-use (e.g., agricultural) water source where none existed prior to ISR operations;

p. "Restoration Action Plan" should be defined and included in the Glossary;

q. "Satellite Facility" should be revised to reflect that such facilities may be connected to a central processing facility via pipeline;

r. "Source Material" should be revised to reflect the AEA definition as incorporated in 10 CFR Part 40 and should differentiate between *licensable*/*licensed* and *non-licensable* source material;

s. "Surety" should be revised to reflect that a surety bond is one of many acceptable 10 CFR Part 40, Appendix A financial assurance mechanisms. NRC should include a definition of "financial assurance" that differentiates between "financial assurance" and "surety," which typically is short-hand for "surety bond;"

t. "Yellowcake" is not typically thought of as a sludge, so NRC should revise this definition to use an established definition such as that on the NRC website glossary

M. APPENDIX B: STATUTES

132. NRC should evaluate the relevance of the Religious Freedom Restoration Act (42 U.S.C. § 2000bb) to ISR environmental licensing reviews;

133. <u>Page B-7, Section B1.1.27:</u> NRC's discussion of EPA regulations relevant to ISR operations is missing the following:

a. 40 CFR Part 190 regulations for dose from licensed operations, excluding radon;

b. 40 CFR Part 192 incorporation of 40 CFR Part 264 for groundwater corrective action;

c. 40 CFR Part 144, Subpart F requirements for financial responsibility for Class I deep disposal wells and 40 CFR Part 146, Subpart G requirements for such wells;

d. 40 CFR § 146.4 requirements for aquifer exemptions;

e. 40 CFR § 146.6 requirements for the "area of review;"

f. 40 CFR § 146.7 authority for post-restoration corrective action;

g. 40 CFR § 146.8 requirements for MITs;

h. 40 CFR § 440.34(b)(1) requirements for discharge of process wastewater from ISR facilities;

i. 40 CFR Part 61, Subpart W's first work practice standard for tailings impoundments

N. APPENDIX C: SUMMARY OF CONVENTIONAL URANIUM MILLING TECHNOLOGIES

134. Page C-1, Line 15: The last sentence of the first paragraph should be changed to "recovery and manage waste disposal;"

135. Page C-1, Lines 19-21: The second sentence of the second paragraph should be revised to read: "Depending on license conditions, a conventional mill may also process alternate feed materials, such as contaminated soils and uranium-bearing process residues from other sites and facilities, for their uranium content."

136. Page C-4, Lines 3-5: The first and second sentences of the first paragraph should be changed to read: "The conventional milling techniques recover about 90-95 percent of the uranium content of the feed ore. Unlike ISL milling, each stage of the conventional milling process typically produces solid, liquid, and gaseous waste streams that require management and/or disposal."

O. APPENDIX D: CULTURAL AND HISTORICAL RESOURCE MANAGEMENT PROCESSES

137. Page D-3, Line 44: The language of Line 44 should be revised to state, "development of a "tiered" environmental assessment or supplemental EIS as project-specific localities are."