KATIE SWEENEY
Executive Vice President & Chief Operating Officer

October 29, 2025

The Honorable David A. Wright
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

RE: Upcoming NRC Rulemaking on Groundwater Protection at Uranium in Situ Recovery Facilities

Dear Chairman Wright:

The National Mining Association (NMA) appreciates the opportunity to submit its views on the appropriate scope of the Nuclear Regulatory Commission's (NRC) upcoming rulemaking related to groundwater protection at uranium *in situ* recovery (ISR) facilities. While prompted by Executive Order (EO) 14300, "Ordering the Reform of The Nuclear Regulatory Commission,"[1] this rulemaking effort has a long history. The NMA's engagement with NRC on potential development of this rule dates to an April 1998 NMA white paper on "Recommendations for a Coordinated Approach to Regulating the Uranium Recovery Industry."[2] Throughout the decades, NMA's has repeatedly advocated for a narrowly tailored risk-informed approach that refines the uranium recovery program to facilitate certainty and eliminate dual/overlapping ISR jurisdiction, especially with respect to groundwater restoration. To minimize repetition, the NMA's previous comments, particularly those submitted on May 3, 2019[3], and June 12, 2020,[4] are hereby incorporated by reference.

---

[1] Executive Order 14300 of May 23, 2025, Ordering the Reform of The Nuclear Regulatory Commission, 90 Fed. Reg. 22587 (May 29, 2025).
[2] NMA, Recommendations for a Coordinated Approach to Regulating the Uranium Recovery Industry, April 1998 (ADAMS Accession No. ML20247B685).
[3] Comments of the NMA on NRC's Jan. 31, 2019, Request for Comment on Resumption of ISR Rulemaking, May 3, 2019 (ADAMS Accession No. ML19127A063).
[4] NMA Letter to the Commission, June 12, 2020 (ADAMS Accession No. ML20167A111).

The NMA is the only national trade organization that serves as the voice of the U.S. mining industry and the hundreds of thousands of American workers it employs before Congress, the federal agencies, the judiciary and the media, advocating for public policies that will help America fully and responsibly utilize its vast natural resources. We work to ensure America has secure and reliable supply chains, abundant and affordable energy, and American-sourced materials that are delivered under world-leading environmental, safety and labor standards. Headquartered in Washington, D.C., the NMA has a membership of more than 250 companies and organizations involved in every aspect of mining, from producers and equipment manufacturers to service providers. Among NMA's members are current and prospective NRC (or Agreement State) ISR licensees that would be impacted by the rulemaking.

Adaptation of NRC's Regulatory Program for ISR Facilities

NRC currently regulates ISR operations through application of regulations that primarily focus on conventional uranium mills and site-specific license conditions. The regulatory program for uranium milling activities was developed and began to mature throughout the 1980s. At the same time, however, the uranium recovery industry began to experience a fundamental shift away from conventional mining and milling. As the industry evolved, ISR operations grew from a small fraction of domestic production to the primary source of production. Resultingly, NRC began in the late 1990s to review its uranium recovery regulations to determine ways to implement a more consistent program for ISR facilities and in 2006, determined to move forward with a rulemaking.[5] The NRC deferred that effort in 2010 when the U.S. Environmental Protection Agency (EPA) announced it would undertake its own rulemaking effort to issue generally applicable standards for ISR facilities that would ultimately need to be conformed to. Nonetheless, the NRC's regulatory framework for ISR facilities consistently proved effective in protecting public health and safety.

In fact, in 2017 comments[6] on the overreaching and burdensome EPA proposed rule, the NRC:

> concluded that its application of the 10 CFR Part 40, Appendix A regulations to ISR facilities meets the [Atomic Energy Act] AEA

[5] NRC, Staff Requirements, COMJSM-06-0001 – Regulation of Groundwater Protection at *in situ* Leach Uranium Extraction Facilities, March 23, 2006 (ADAMS Accession No. ML060820503).
[6] NRC, Staff's Comments on the U.S. Environmental Protection Agency's Proposed Rulemaking for 40 CFR Part 192, 82 FR 7400, July 18, 2017 (ADAMS Accession No. ML17173A638).

> standard of "adequate protection" of public health and safety and the environment. The basis for this conclusion is the established safety record of the NRC licensed ISR facilities. The NRC staff began a rulemaking specific to ISR facilities in 2006 for the purpose of standardizing existing NRC regulatory practices to ensure consistency in the NRC staff's evaluation and approval of ISR license applications. This rulemaking would have amended 10 CFR Part 40, Appendix A by codifying proven license conditions and staff practices, as reflected in guidance documents, into the 10 CFR Part 40, Appendix A regulations. By revising NRC's regulations to specifically address ISRs, the NRC staff concluded that the ISR licensing process would be more effective, consistent, and transparent. This rulemaking has been in abeyance since 2010 as a result of EPA's stated intention to promulgate generally applicable standards. . .
>
> The NRC staff did not believe in 2006, when it initiated its rulemaking, and does not believe now, that ISR uranium activities that are operated under the existing regulatory framework have caused, or are likely to cause, any contamination by listed hazardous constituents of adjacent or nearby aquifers or the non-exempt portion of the aquifer that is the subject of the licensed uranium ISR extraction activity. The NRC, through its requirements for extensive testing of licensee monitoring and private wells in and around its licensed ISR sites, has not found evidence to challenge that finding. . .
>
> In almost 40 years of operational experience, the NRC staff is aware of no documented instance of an ISR wellfield being the source of contamination of an adjacent or nearby aquifer, or of the non-exempt portion of the same aquifer in which ISR activities are being conducted.

The 2017 NRC comments echo earlier findings from NRC, including the 2009 "Staff Assessment of Groundwater Impacts from Previously Licensed In-Situ Uranium Recovery Facilities."[7] That document concluded, with respect to NRC-approved aquifer restorations at ISR wellfields, that:

> The impacts to groundwater in the exempted aquifer met all regulatory standards for the state or EPA's underground injection control (UIC) program, met the quality designated for its class of

[7] NRC, Staff Assessment of Groundwater Impacts from Previously Licensed In-Situ Uranium Recovery Facilities, July 10, 2009 (ADAMS Accession No. ML091770187).

> use prior to ISR operations, have been shown to decrease in the future due to natural attenuation processes, and have been shown to meet drinking water standards at the perimeter of the exempted aquifer. Therefore, the impacts to the exempted aquifer for each of the approved restorations do not pose a threat to human health or the environment.

Ultimately in 2018, EPA conceded that NRC and other stakeholders' concerns had merit. In withdrawing the proposed rules, the agency acknowledged the efficacy of the existing ISR regulatory framework and agreed that there were serious questions concerning whether the proposal's underlying legal authority. Even so and despite over 40 years of data, misperceptions about the efficacy of NRC's regulatory program for ISR facilities persist. Some of these misperceptions stem directly from the fact that NRC currently regulates ISR operations through application of regulations that primarily focus on conventional uranium mills and site-specific license conditions. Those experienced with the existing regulations and license conditions, such as NRC, state regulators and ISR licensees, understand the comprehensive nature of NRC's regulations. The lack of understanding by other stakeholders leads to perceptions that there are gaps in NRC's coverage, even when they may be aware of other agencies' roles in regulating ISR facilities. This lack of understanding creates vulnerabilities for both NRC and its licensees. It is in this context that NMA believes a narrowly tailored, risk-informed, performance-based rulemaking may be appropriate.

The Wyoming Mining Association (WMA) on Oct. 16 submitted its observations on the potential rulemaking. The NMA endorses and supports that filing as a comprehensive summary of data demonstrating the low-risk nature of ISR operations. WMA's compilation provides further evidence in support of a risk-based, narrowly-scoped rulemaking.

Major Concerns with the 2021 Prepublication Version

Subsequent to an Oct. 2020 Commission staff recommendation memorandum (SRM)[8] to restart the rulemaking, NRC released a prepublication version of a proposed rule.[9] This version was not formally proposed and the Commission never acted to approve its publication. As such, the NMA did not prepare comments on the prepublication version as its future was unclear. The association, however, has significant concerns with the NRC staff's 2021 approach, which conflicts with the Commission's

[8] NRC, Staff Requirements – SECY-19-0123 – Regulatory Options for Uranium *In Situ* Recovery Facilities, Oct. 22, 2020 (ADAMS Accession No. ML20296A469).
[9] NRC, Prepublication Version of ISR Rulemaking, July 23, 2021 (ADAMS Accession No. ML21067A127).

express goal in the SRM to craft a "narrowly targeted" rule. In contrast with recommended revisions to 10 CFR part 40 provided in the NMA's 2020 letter, the staff prepublication version went well beyond the codification of language that represents how NRC currently regulates ISR facilities in practice. Rather than codifying appropriate license conditions, guidance and commission decisions, the 2021 version adds unnecessary regulatory burdens that would impede domestic uranium production.

We believe the 2021 approach undermines the objectives underlying recent actions by both the administration and Congress to secure the nuclear supply chain and reduce reliance on foreign sources of uranium. For example, EO 14300 mentioned above was just one of the four EOs[10] issued earlier this year to "usher in a nuclear renaissance" through policies to secure nuclear supply chain. The general purpose of these EOs is to simplify and streamline processes, including regulatory ones related to nuclear energy. Congress has similarly recognized the importance of securing the nuclear supply chain with the passage of the Prohibiting Russian Uranium Imports Act in 2024.[11]

Against this backdrop, with the focus on rightsizing regulations and removing impediments to securing mineral supply chains, the NRC should reject certain unjustified and onerous provisions contained in the 2021 draft rule. Major concerns with the 2021 version are summarized below and more extensively detailed in Attachment A.

- **Post-Restoration Monitoring**

Criterion 14(f)(1)(ii) in the 2021 prepublication proposal would require at least three years of quarterly post-restoration monitoring at the point of compliance in the production unit after the licensee's groundwater restoration efforts have met the approved hazardous constituent concentrations.[12] This deviates from the existing practice of requiring at least one year of quarterly post-restoration monitoring. The provided rationale for the change is to comply with section VII(c) of the Memorandum of Understanding (MOU)[13] between the NRC and the EPA in which the parties agreed that if EPA were to promulgate standards of general application

[10] *See* EO 14299, Deploying Advanced Nuclear Reactor Technologies for National Security; EO 14301, Reforming Nuclear Reactor Testing at The Department of Energy; EO 14302, Reinvigorating the Nuclear Industrial Base.
[11] Public Law No: 118-62, May 13, 2024.
[12] Prepublication version at p. 90.
[13] Memorandum of Understanding Between the U.S. Nuclear Regulatory Commission and the U.S. Environmental Protection Agency Concerning the Regulation of Uranium in situ Recovery Activities," July 23, 2020 (ADAMS Accession No. ML20218A248).

under its authority in the Atomic Energy Act, the model framework for ISR facilities would be Subtitle C of the Safe Drinking Water Act or more specifically 40 CFR 264.96(c) and 40CFR 264.100(f). However, EPA has not promulgated such standards and further, there is no scientific basis on which to support such an extended period of monitoring.

Changes to stability monitoring to solely comply with an MOU or to existing Resource Conservation and Recovery Act standards are not risk-based and do not meet the intent of EO 14300. As stated above, in more than 40 years of operational experience, NRC staff have stated that they were not aware of any documented instances for an ISR wellfield being the source of contamination of an adjacent or nearby aquifer and that there had been sufficient post-restoration monitoring data to show that ISR wellfields were not a source of contamination of non-exempt aquifers. Adding years of stability monitoring requirements results in significant resources and adds minimal environmental benefit or risk reduction. In response to the EO, NRC should re-evaluate the existing MOUs and ensure regulations and policies governing ISR operations are commensurate with risk.

- **Placement of Point of Compliance Wells**

Criterion 14(b)(3)(i) would require the licensee to identify one point of compliance well in the production unit and the aquifers immediately overlying and underlying the production zone per acre of production unit.[14] This requirement would quadruple the existing practice of one group of compliance wells per four acres of pattern area. The change would result in unjustified and significant additional cost for operators. Again, given the staff's 2009 conclusions that were reiterated in 2017, that "NRC staff is aware of no documented instances for an ISR wellfield being the source of contamination of an adjacent or nearby aquifer," this requirement for additional monitoring is unwarranted. Fundamentally, the draft proposal is not risk informed.

Additional Regulatory Efficiencies

While not directly related to the upcoming rulemaking, the NMA wishes to take this opportunity to advocate for other regulatory efficiencies aligned with the administration's efforts to reduce unnecessary regulatory burdens and permit delays. To that end, the NMA urges the NRC to:

- Develop deadlines to ensure timely and appropriate reviews of required submittals such as those related to the completion of

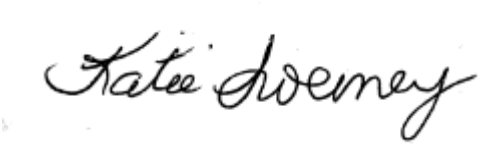
[14] Prepublication version at p. 81.

groundwater restoration, granting of specific types of license amendments and approval of Completion Review Reports;
- Improve coordination and collaboration with Agreement and non-agreement state regulatory agencies that have direct primacy over state groundwater resources to minimize duplicative oversight.
- Evaluate opportunities to allow additional flexibility and latitude to move forward with respect to groundwater restoration phases without regulatory approval.
- Facilitate modifications to groundwater restoration volume surety when adequately justified by licensee.

Conclusion

NMA appreciates the opportunity to submit these comments and would support a narrow rule to shore up vulnerabilities that have been created by lack of specificity within NRC regulations for groundwater protection at ISR facilities. If you have any questions regarding these comments, please contact me at ksweeney@nma.org.

Sincerely,



Katie Sweeney

CC: The Honorable Bradley R. Crowell
The Honorable Matthew J. Marzano
Jonathan Marcano Lozada, Technical Assistant for Materials (Wright)
David Brown, Technical Assistant for Materials (Brown)
Hector Rodriguez, Technical Assistant for Materials (Marzano)

ATTACHMENT A
Concerns with 2021 Staff Prepublication ISR Rulemaking

Overall Comments

Comment 1: The rule should have a statement that compliance with guidance is generally considered to demonstrate compliance with the rule.

Comment 2: Executive Order (EO) 14300, *Ordering the Reform of the Nuclear Regulatory Commission* discusses specific deadlines for final decisions on applications for specific licensing actions. Any new uranium ISR rule should contain specific deadlines for the completion of reviews, especially for approvals concerning groundwater restoration, and approval of Completion Review Reports.

Comment 3: The rulemaking is silent to the fact that in-situ operations generally take place within exempt portions of an Underground Source of Drinking Water (USDW) under 40 CFR Part 146. The fact that uranium ISR occurs within an exempted portion of an aquifer and that no such aquifer exemption has been rescinded should greatly reduce the risk of such operations and should be considered in the response to EO 14300. As discussed above the low risk to groundwater posed by ISR operations is well-documented by NRC.

Comment 4: Any changes to NRC reliance to the linear no threshold model for radiation exposure and the "as low as reasonably achievable" standard should be reflected in the ISR rulemaking and NRC guidance. Recommend removing ALARA from 10 CFR 40 Criterion 5B (6).

Comment 5: 10 CFR 40.32(e) Construction Rule Clarification
As NRC contemplates an ISR rule, consideration should be taken to clarify 10 CFR 40.32(e) to explicitly dictate what activities can be performed prior to the issuance of a radioactive material license. This is important because violation of 40.32(e) could result in denial of an application. Implementation of the regulation above has resulted in inconsistent application across ISR operations. Standardization would result in a more robust regulatory framework and provide greater certainty to licensees.

Comment 6: 10 CFR Part 40.32 Timeliness in Decommissioning
The proposed rulemaking is silent as it relates to timeliness of decommissioning at ISR facilities. Clarification on the rule should be made as it relates to ISR recovery. It is unlikely that most wellfields can be fully restored with stabilization confirmation within a 24 month timeframe. Thus, every operator is required to seek an exemption. The new rule calls for

restoration action plans (RAP) that provide for siter specifics including wellfield specific restoration plans. It is unclear how a decommissioning plan would add any additional details not covered in a RAP. We suggest the following change to 40.32 (e)(l): Specific licenses for uranium and thorium milling are exempt from paragraphs (d)(4), (g) and (h) of this section with respect to reclamation of tailings impoundments and/or waste disposal areas, as well as the restoration of groundwater in wellfields associated with licensed ISR wellfields.

10 CFR 40 Appendix A

Definitions

Point of Compliance*- means a site-specific location in the uppermost aquifer where the groundwater protection standard must be met and at which monitoring must be conducted. For ISR operations, the point of compliance also includes a site-specific location below the uppermost aquifer in the production unit in the wellfield, or in aquifers adjacent to, above, or below the production unit where groundwater protection standards must be met.*

The definition of Point of Compliance should be revised so it only applies to aquifers that can be reasonably expected to be impacted by byproduct. For example, it would not be reasonable to expect monitoring of an underlying point of compliance aquifer if it is separated from the production aquifer by 1,000 feet of shale. NUREG Section 5.7.8.3(5)(c) adequately addresses the concern.

Criterion 14 Groundwater Protection Standards for ISR facilities

Criterion 14(a) – *Site characterization and suitability demonstration. In accordance with 10 CFR 40.31(h) and 40.32, the NRC will approve an application for a license to operate a new ISR facility, or in accordance with 10 CFR 40.45, the NRC will approve an amendment to add a new wellfield within a licensed ISR facility or a new production unit within an operating wellfield of a licensed ISR facility, if the applicant adequately demonstrates the ability of the geologic and hydrologic units to hydraulically isolate byproduct material from any aquifers immediately overlying, underlying, and adjacent to the production unit.*

The language does not contemplate engineering methods to control excursions beyond hydrologic isolation. NUREG 1569 (Section 2.11.1.4) allows for engineering controls. Additionally, Criterion 14(b)(1)(vi) implies

the use of engineering controls to mitigate areas that have hydraulic connection. We recommend revising the language as follows:

> *(a) Site characterization and suitability demonstration. In accordance with 10 CFR 40.31(h) and 40.32, the NRC will approve an application for a license to operate a new ISR facility, or in accordance with 10 CFR 40.45, the NRC will approve an amendment to add a new wellfield within a licensed ISR facility or a new production unit within an operating wellfield of a licensed ISR facility, if the applicant adequately demonstrates the ability of the geologic and hydrologic units or operational controls to hydraulically isolate byproduct material from any aquifers immediately overlying, underlying, and adjacent to the production unit.*

Additionally, the language dictates each wellfield or production unit within a wellfield will be approved as an amendment. This implies it would require an amendment to the radioactive material license. This deviates from previous practices where approvals were given to the specific package without the need for a license amendment. We recommend NRC clarify the approval mechanisms for new wellfield data submittals.

Criterion 14(a)(9)

(9) An assessment of the groundwater quality, including radiological and nonradiological constituents present and an assessment of the hydrologic parameters, including potentiometric heads, hydraulic gradients, and water levels in the uppermost aquifers, the production unit, and aquifers immediately overlying, underlying, and adjacent to the production unit. These assessments must include an evaluation of any seasonal and historical variability of the groundwater quality or the hydrologic parameters. These assessments must be done at least on a quarterly basis for one year immediately before filing a license application.

Criterion 14(a)(9) requires a year of baseline monitoring in some cases. NUREG 1569 Section 2.7.3.5 requires baseline data collection for at least one year for regional groundwater wells completed in the uppermost, underlying and overlying aquifers. Section 2.7.3.6 requires pre application collection of surface water data.

We do not disagree with the need for a year of regional baseline data collection to capture seasonal variability (especially for shallow wells), we request that the NUREG be revised so the data can be collected during the licensing process instead of prior to filing an application. The licensing decision is not based on the results of the monitoring, so it is not important

for NRC staff to perform a technical analysis on the data other than to verify it was collected using appropriate techniques. The NRC staff can receive and verify the quality of the data during the license review process.

Criterion 14(b)(1)(i), (iv),(v)(vi)

(a) Wellfield pre-operational requirements. Pursuant to the definition of construction in 10 CFR 40.4, no wells associated with radiological operations (e.g., production, injection, or monitoring well networks associated with ISR facilities) may be installed in the wellfield prior to the NRC issuing the license. After the issuance of the license, the licensee must submit the information required in paragraphs 14(b)(1) through 14(b)(5) of this criterion to the NRC. The NRC must approve the background hazardous constituent concentration levels and the selected indicator constituents and associated upper control limits submitted in accordance with paragraphs 14(b)(3) and 14(b)(4) of this criterion and the wellfield restoration plan submitted in accordance with 80 paragraph 14(b)(5) of this criterion before the licensee may inject lixiviant into any injection well in the wellfield. (1) Wellfield characterization. The licensee must provide the following:

- *(i) A map showing the as-built wellfield and infrastructure, including the location of the injection, production, and point of compliance wells.*
- *(ii) Cross sections showing the geologic and hydrologic units across the wellfield. Maps and cross sections must indicate the horizontal and vertical limits of aquifers and aquitards, their ground water elevation levels, their thickness, and their position relative to the production unit in the wellfield.*
- *(iii) A description of all hydrologic parameters used to determine expected operational and restoration performance of the wellfield, and descriptions of aquifer pumping tests used to determine parameters such as, but not limited to, hydraulic conductivity, transmissivity, and specific storage.*
- *(iv) A demonstration of a horizontal hydraulic connection between injection and production wells within the production unit.*
- *(v) A demonstration of a hydraulic connection between the injection and production wells and the point compliance wells in the immediately adjacent aquifer surrounding the production unit.*
- *(vi) A demonstration of either a lack of hydraulic connection between the injection and production wells and the*

immediately overlying and underlying aquifers to the production unit or a method to mitigate any existing hydraulic connection to these aquifers.

The Criterion requires the pre-injection submission of an as-built showing the location of all injection and production wells and pump tests demonstrating hydraulic communication between injection and production and monitor wells. Complying with these provisions would require the installation of all injection and production wells in a wellfield prior to performing the wellfield pump test. This is inconsistent with current practices and would create significant cost and delay for operators. We suspect the NRC did not intend to require all injection and production wells be installed pre-injection, but unintentionally created this issue by using the words "injection wells" and "production wells" instead of "monitor wells" for item i and "production zone" for items iv, v and vi. The current practice is to rely on geophysical logs of dozens if not hundreds of drill holes and pump tests involving underlying, overlying, production zone and perimeter monitor wells to determine hydraulic characteristics. We encourage the NRC to continue to rely on monitor well pump tests involving an adequate number of representative monitor wells to demonstrate hydraulic communication, or lack thereof.

To resolve this issue, in Criterion 14(b)(1)(i), the NRC should revise the language to require only an as built map of the injection and production wells after the entire wellfield is constructed, which is typically post injection instead of pre-injection. Additionally, this requirement is impractical since every drill hole that may or may not become an injection or production well provides an additional data point that could change the location and layout of the wellfield based on that additional data. Further, it has been the practice for NRC and Agreement State licensees to apply for a production area authorization (wellfield approval) based on a planned wellfield with as-built monitor wells and point of compliance wells located "as-built." This requirement could place a licensee at significant financial risk with respect to installing a complete wellfield and await further approval of the wellfield by the Commission or Agreement State prior to injection activities.
To resolve this issue for Criterion 14(b)(1)(iv, v and vi) please exchange the words "injection and production wells" with "within the production zone" or "production zone" as appropriate.

We hold the same concern with NUREG 1569. NUREG 1569 Section 2.11.1.2 items 3 and 4 and Section 2.11.1.3 item 1(a), require an as built map showing the location of injection and production wells in the wellfield data package. We encourage the NRC to revise the language to clarify the map only needs to be submitted after all injection and production wells have been

installed; which is post injection instead of pre-injection. Section 2.11.1.3 items 3, 3(a), 4(b) and Section 2.11.1.4 require a pump test demonstration of a hydraulic connection between injection and production wells within the production zone. We encourage the NRC to revise these and other portions of the NUREG to clarify that pump tests can rely on the monitor wells instead of involving every single injection and production well.

To further clarify the problem generated by the language proposed by the NRC, injection in the first header house could not occur until all injection and production wells for the entire wellfield are installed. For the sake of a realistic discussion, let us consider a wellfield that has 12 header houses and each header house contains 60 wells (injection plus production). That means before injection in the first header house could begin the operator would need to install and bond for the abandonment of 660 additional wells. If each well costs $14,000, the operator would be required to spend up to $9.2 million pre-maturely and would also have significant bonding costs. The installation of so many wells will delay production for about two years in the realistic scenario provided. The two additional years of disturbance could cost the operator millions of dollars in lost or delayed sales contracts and has the potential to increase impacts to the environment. Further, to minimize the impact of the regulation, operators would likely hire a large number of employees to try to get ahead and then lay them off once construction of the mine unit is complete. This is an inefficient way to run a business and would introduce instability into the workforce.

Criterion 14(b)(i)

(i) The licensee must identify the point of compliance wells in the production unit and the aquifers immediately overlying, underlying and adjacent to the production unit. The point of compliance wells must be located in the immediately overlying, underlying, and adjacent aquifers to the production unit and at least one well, which may be a production or injection well, per acre within the production unit unless otherwise approved by the NRC. The number, location, and screen interval of the point of compliance wells in the production unit and the aquifers immediately overlying, underlying and adjacent to the production unit must be shown to be sufficient to provide a representative sample of the background hazardous constituent concentration levels. The licensee must provide the number, location, and the screen interval of the point of 82 compliance wells and the technical justification for their selection to the NRC for approval.

This quadruples the existing practice of one group of compliance wells per four acres of pattern area. The change would result in significant additional cost, and it is unclear the rationale for the change. As was stated by NRC

staff (ML17173A638) "NRC staff is aware of no documented instances for an ISR wellfield being the source of contamination of an adjacent or nearby aquifer." The requirement for additional monitoring is unwarranted as no detriment has been reported, the requirement tries to protect for a remote risk without appropriate regard for the additional burden placed on the industry. NUREG 1569 allows for density of up to 1 group of monitoring wells per 4 acres. State guidance prescribes one grouping every 4 acres.

Criterion 14(d)(1)(iv)(A)

(A) A formation testing program to obtain minimum fracture pressure and average fluid pressure in the production unit;

Comment: Criterion 14(d)(1)(iv)(A) requires testing to obtain minimum fracture pressure and average fluid pressure in each production unit. The only way to obtain the fracture pressure is to perform a test that actually results in the fracture of the rock. Such a test on UIC Class III wells isn't allowed under EPA rules and therefore cannot be carried out as required in the draft rule. The reason the practice of fracturing isn't allowed is because it could result in fractures that allow lixiviant to migrate into Underground Sources of Drinking Water and because it could allow the lixiviant to "short circuit" the mineralization. We recommend that industry be allowed to continue the conservative practice of calculating the fracture pressure based on standard methods. Additionally, Criterion 14 (d)(1)(iii) indicates that the injection pressure is to be calculated to ensure that injection does not initiate new fractures or propagate existing fractures.

This Criterion, in many ways, is completely duplicative of 40 CFR §146.8 and §146.31 through §146.34.

Criterion 14(e)(1)(i)

(e) Mechanical integrity. Demonstration of mechanical integrity of injection and production wells is required before initial use and before reuse of wells that have been serviced with equipment or procedures that could damage the well casing, and at least once every 5 years thereafter. (1) A well is deemed to have mechanical integrity if: (i) There is no significant leak in the casing, tubing, or packer; and (ii) There is no significant fluid movement into an aquifer through vertical

The Criterion refers to tubing and packers. This language is inconsistent with 40 CFR §146.33. Since tubing (as is intended here) and packers aren't used in UIC Class III wells, we recommend tubing and packers be removed from

this section. Tubing and packers are used in UIC Class I wells, not UIC Class III wells, to contain and control movement of fluid.

Criterion 14(e)(1)(ii)

(ii) There is no significant fluid movement into an aquifer through vertical channels adjacent to the injection well bore.

(2) One of the following methods must be used to verify the absence of significant leaks under paragraph 14(e)(1)(i) of this criterion:

(i) Following an initial pressure test, monitoring of the casing annulus pressure with sufficient frequency to be representative as approved by the NRC, while maintaining an annulus pressure different from atmospheric pressure measured at the surface; or

(ii) A pressure test with liquid or gas.

(3) Tests, other than those listed in paragraph 14(e)(2) of this criterion, may be used to demonstrate mechanical integrity with the approval of the NRC

It is unclear how to show compliance with having "…no significant fluid movement into an aquifer through vertical channels adjacent to the injection well bore." Currently, the draft regulations only provide for monitoring of the annulus pressure and a pressure test using liquid or gas.

Current best practices rely on approved well completion methods as sufficient evidence that there will be no vertical channels adjacent to the well bore. We recommend the draft language be amended so that implementation of proper completion techniques is an adequate demonstration. This change would be consistent with EPA regulations. Additional detail on why the deviance from accepted practices is requested in Notice of Rulemaking.

Criterion 14(g)(2)

(2) Before abandoning injection, production, or point of compliance wells, or any other well associated with any corrective action taken pursuant to paragraph 14(h) of this criterion, the wells must be plugged with cement in a manner which will not allow the movement of byproduct material either into or between aquifers. The NRC may allow injection or production wells to use other plugging materials if the NRC is satisfied that such materials will prevent movement of byproduct material into or between aquifers.

This section is unnecessarily duplicative of 40 CFR §146.10 and is, in some places, counter to existing state UIC regulations. A Licensee is not only required to get approval from the Commission for an injection well plugging

program, it must also get approval from the EPA Administrator or delegated State Agency for exactly the same information. We encourage the NRC to revise the draft rule to allow the use of bentonite, in addition to the already listed cement, to plug wells. The efficacy of bentonite for plugging wells has been long established and is approved by the state of Wyoming as an appropriate abandonment material capable of preventing migration of fluids.[15]

Criterion 14(h)(1)

(1) If an excursion is not eliminated within 60 days of confirmation:

(i) The licensee must terminate injection of lixiviant into the production unit.

(ii) The licensee must conduct sampling to determine whether any hazardous constituent has exceeded their approved concentration limits at the point of compliance well with the confirmed excursion. If any hazardous constituent has exceeded its approved concentration limits, the licensee must characterize the extent of the contamination and take corrective action to the extent necessary to achieve compliance with the approved concentration limits.

(iii) The licensee must provide an increase to the financial surety for corrective action in accordance with paragraph 9(f)(4) of this appendix.

(iv) The corrective action must continue until the hazardous constituent concentration levels meet their approved concentration limits. The licensee must then provide a report for NRC approval describing the corrective action taken, the corrective action results and monitoring data that demonstrates that the hazardous constituents meet their approved concentration limits. If NRC confirms that the corrective action is completed, the additional surety requirements resulting from the excursion may be removed.

This requirement differs from existing licenses that only indicate that injection must be stopped if the excursion isn't corrected or if financial assurances aren't put in place. With the existing statement by NRC staff (ML17173A638) "NRC staff is aware of no documented instances for an ISR wellfield being the source of contamination of an adjacent or nearby aquifer" it is unclear why changes have been made to the existing standard operating practices. If injection is to be stopped until the excursion is eliminated, we recommend changing the language to "the licensee must terminate injection

[15] *See* Wyoming Land Quality Division *Interim Policy for Compressed Bentonite Briquettes for Well Plugging.*

within 200 feet of the excursion," This would cover a distance of about two pattern areas and is generally adequate to control and correct an excursion.

Criterion 14(H)(2)(iii)

(iii) At least every 2 weeks, a sample must be taken for the approved indicator constituents in the point of compliance wells in aquifers immediately overlying, underlying and adjacent to the production unit for excursion detection.

The existing practice, as documented by license conditions and in agreement with State Regulations, is that wells are sampled twice monthly with at least 10 days between sampling events. We request the NRC change language to twice monthly with 10 days in between sampling events to allow flexibility and compliance with State regulations while still providing adequate environmental protection.

Criterion 14(f)(1)(i) and (h)(2)(iii)

(i) Following completion of restoration in a production unit, an NRC-approved post-restoration monitoring program must be implemented at the approved point of compliance wells in the wellfield restoration plan. The post-restoration monitoring program must include quarterly sampling at each approved point of compliance well for three years to analyze whether hazardous constituents exceed their approved concentration limits pursuant to paragraph 5B(5) of this appendix. The analysis must be performed on a well-by-well basis.

(ii) Post-restoration monitoring for each production unit is deemed complete when groundwater samples, collected quarterly from point of compliance wells, show that hazardous constituent concentration levels have remained below their approved concentration limits with no statistically significant exceedance for three consecutive years.

These provisions allow the NRC to restart the three-year stabilization clock if the corrective action is deemed unsuccessful. Language should be added to NUREG 1569 to discuss gross alpha and gross beta measurements. Industry and government use gross alpha and beta as a screening tool for water quality. The measurement of gross alpha is subject to substantial error, bias, and non-reproducibility. Although NRC is required to measure gross alpha as part of Table 5C of Appendix A, it is an unreliable parameter for restoration stability success. Exceedance of gross alpha/beta measurements should not initiate the restart of stability monitoring and discussion on gross alpha and beta should be captured in the rule itself or in NUREG 1569.

NRC Guidance and Policy

As indicated in the Executive Order, NRC is requested to evaluate all guidance as well as regulations. We encourage NRC to evaluate current guidance affecting uranium recovery operations to ensure that practices are commensurate with the risks of uranium recovery and are scientifically based. More specifically below are practices that should be evaluated:

1) Consider revision to Regulatory Guide 4.14. The guidance is outdated and was developed for conventional mills. Specifically, the NRC should evaluate whether weather stations and particulate air monitoring stations for ISR facilities are necessary? ISR recovery facilities have years of environmental data showing no to very minimal airborne effluent. Is this a practice that is commensurate with the risk?

2) Consider revisions to Regulatory Guide 8.31. Are credentials for Radiation Safety Officers and Health Physics Technicians comparable to other industries with similar risks? Is the amount of rigor appropriate for the risk associated with uranium recovery operations?

3) Consider evaluation of staff's position on compliance with 10 CFR 40.65. Compliance is currently being evaluated under interim guidance.[16] ISR facilities monitor radon and associated daughter products across the operations through the use of passive track etch detectors. The data is used to ensure compliance and calculate dose to members of the public. Additionally, NRC and Agreement States have required operations through license conditions to measure or calculate the quantity of emissions from individual sources across the operations. This includes central processing plants, wellfields, and satellites. The measurement and calculation of radon emitted from these sources is highly variable, requires substantial resources to collect, and provides little to no benefit as compared to passive monitors already deployed. NRC should evaluate this policy and determine if the practice is commensurate with the risk. EO 14300's call for NRC to "reconsider reliance on the linear no-threshold (LNT) model for radiation exposure and the "as low as reasonably achievable" standard, which is predicated on LNT" provides an additional reason for reconsideration of this guidance.

[16] NRC Interim Staff Guidance, DUWP-ISG-01, "Evaluations of Uranium Recovery Facility Surveys of Radon and Radon Progeny in Air and Demonstrations of Compliance with 10 CFR 20.1301," June 20, 2019 (ADAMS Accession No. ML15051A002).

4) Inconsistencies exist across industry on the monitoring of personnel for beta and alpha contamination. Multiple licenses are required by license condition to monitor for beta and alpha while others solely monitor for alpha. In evaluation of the issue NRC should evaluate the practice and implement changes through the development of guidance.

5) Although a rule change may be required the NRC should evaluate the definition of 11e.(2) byproduct material and determine if de-minimis quantities or a general license for 11e.(2) byproduct material is appropriate. General licensing exists for source material as well as unimportant quantities and specific exemptions (10 CFR 40.22, 10 CFR 40.13 and 10 CFR 40.14). A similar structure could be created for 11(e).2 byproduct material.

Chairman Resource

From: Sweeney, Katie <KSweeney@nma.org>
Sent: Wednesday, October 29, 2025 9:38 AM
To: Chairman Resource
Cc: CMRCrowell Resource; CMRMarzano Resource; jonathan.marcano@nrc.gov; David Brown; Hector Rodriguez
Subject: [External_Sender] NMA Letter on Upcoming NRC Rulemaking on Groundwater Protection at Uranium in Situ Recovery Facilities
Attachments: 2025 ISR Rulemaking Letter to NRC.pdf

Chairman Wright,

As a follow-up to the National Mining Association's (NMA) recent meetings with commission offices, please find attached a letter identifying the uranium recovery industry's concerns with the Nuclear Regulatory Commission's (NRC) 2021 prepublication version of the groundwater in situ uranium recovery rule and our rationale for a narrowly scoped rule. The NMA looks forward to continued engagement with the NRC as it moves forward with the rulemaking as part of broader efforts to comply with Executive Order 14300.

Best,

Katie Sweeney

NMA National Mining Association

Katie Sweeney
Executive Vice President and Chief Operating Officer
National Mining Association
101 Constitution Ave. NW, Suite 500 East
Washington, D.C. 20001
Phone: (202) 463-2600
Direct: (202) 463-2627
ksweeney@nma.org