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Via Electronic and First Class Mail

Chief, Rules Review and Directives Branch
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U.S. Nuclear Regulatory Commission
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RE: Natural Resources Defense Council Comments on Uranium Recovery GEIS

Dear Sir/Madam:

The Natural Resources Defense Council (NRDC) writes today to comment on the Nuclear Regulatory Commission's (NRC) *Notice of Intent to Prepare a Generic Environmental Impact Statement for Uranium Milling Facilities* (hereinafter "Uranium Recovery Generic NOI"). 72 Fed. Reg. 61912 (November 1, 2007). NRDC respectfully urges the NRC to immediately withdraw the Uranium Recovery Generic NOI.

As will be discussed in detail later in these comments, the impacts of uranium mining and milling – and specifically the effects of ISL mining on scarce groundwater resources – are inherently site specific and have profound and lasting environmental impacts. A basic "generic" analysis uranium recovery processes, combined with only a site specific Environmental Assessment (EA) and a subsequent Finding of No Significant Impact (FONSI) would be grossly inadequate and would, in light of the environmental impacts at any conceivable uranium recovery site, fail to comply with the requirements of the National Environmental Policy Act (NEPA) 42 U.S.C. § 4321 et seq. Indeed, a complete Environmental Impact Statement (EIS) is necessary to comply with the requirements of the National Environmental Policy Act (NEPA), 42 U.S.C. § 4321 et seq. in each and every instance of a uranium recovery license application.

Equally important, in this notice the NRC has not defined or even prospectively identified the specific licensing actions or sequence of connected licensing actions that would constitute a "major federal action" triggering the need for NEPA review. Simply stating that a number of license applications potentially could be filed, and then attempting in advance to streamline an environmental review process to facilitate processing of these anticipated applications, does not constitute a legitimate proposal for major federal

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action. Such a position presumes that streamlining the environmental review process is an appropriate action before alternatives have even been presented, much less defined. Indeed, we can discern no proposed major federal action other than a systemic weakening of the environmental review process that must accompany each and every license application for uranium recovery. If this is indeed the agency's proposal, such action amounts to an alteration of the agency's licensing rules that must be accompanied by a rulemaking proposal and a broader NEPA review of the environmental impacts.

By contrast, if the NRC were to commence work on a limited (but as yet undefined) set of programmatic issues addressing the appropriate environmental review for uranium recovery, the NRC should issue a scoping document for a Programmatic Environmental Impact Statement (PEIS) that proposes: (a) performing a full analysis of the purpose and need for a national program for uranium recovery; (b) performing an inter-agency assessment of alternatives for any national uranium recovery program with the other federal agencies that have related statutory responsibilities; (c) addressing and identifying the extensive environmental damage from past uranium mining and milling practices; (d) identifying current and applicable regulatory standards as they relate to management of the specific and serious environmental impacts from a national program of future uranium mining activities and as such (e) identifying any gaps or lack of coverage in statutory or regulatory authority to address and mitigate the environmental impacts of uranium recovery.

I. The Environmental Impacts of Uranium Recovery

The history of uranium recovery and management in the United States (and indeed, around the globe) is replete with environmental damage, serious worker safety and health abuses, and harm to entire communities. Many of the affected communities have been both low-income and majority indigenous, representative of an industry's all too common pattern of environmental injustice. Additionally, most of the environmentally damaged sites have not received adequate cleanup of past harms, and for what little cleanup has been done, most of the cost has been borne by taxpayers rather than the companies and associated beneficiaries of the uranium mined.

A. Methods of uranium mining

Environmental and public health impacts of uranium recovery occur during all phases of the process: exploration mining, milling, and waste disposal. As the NRC is well aware, uranium mining and milling were historically two separate operations, generally adjacent to one another. Uranium has been mined one of three ways, depending on the depth and ore grade of the uranium deposit and the associated geology: (1) via underground mining and extracting the uranium deposits through deep shafts; (2) via surface mining, or open pit techniques, extracting shallow deposits of uranium ore; and (3) via in situ-leach ("ISL" or "solution") mining, where a leaching solution is pumped into a uranium deposit located between two layers of rock – i.e., the ore bearing portion of an aquifer – dissolving the uranium off the host rock and into the aquifer where it can be pumped to the surface.

B. Impacts from traditional methods of mining

Uranium mining brings to the surface and concentrates naturally occurring radioactive elements and potentially toxic heavy metals that otherwise would remain distributed and undisturbed within the earth's crust. The huge amount of waste left from traditional uranium mining, called tailings, has posed a significant threat to the environment and public health for more than half a century. The uranium ore is pulverized and processed through chemical leaching to remove the yellowcake. The great majority of the product is waste. Only a fraction of the ore contains the valuable uranium oxide; approximately one to five pounds are extracted from each ton of ore. Indeed, toxic and radioactive uranium mining tailings piles litter and contaminate the western landscape of the United States. These tailings contain more than three-fourths of their original radioactivity and much of the original toxic heavy metals after the extraction of the yellowcake. Uranium decay products, such as thorium-230 (with a half-life of 80,000 years) and radon (an air-borne gas) remain in the tailings.

The dangers from these uranium recovery operations are not simply theoretical or isolated. Literally thousands of abandoned uranium mines cover the western United States and uranium mill sites are still, decades later, in the process of being cleaned up under an inadequate patchwork of regulations discussed later in these comments. But to take one illustrative example; in 1979, a tailings dam in Church Rock, New Mexico fractured and ninety-three million gallons of radioactively and chemically contaminated liquid and 1,100 tons of solid radioactive tailings were deposited into the Rio Puerco River, contaminating the river more than sixty miles downstream. See Attachment 1, Sierra Club Bulletin, 1980, where the Rio Puerco spill is described as "possibly the worst incident of radiation contamination in the United States." And in a recent hearing before the United States Congress, a senior representative of the Navajo Nation stated:

> Uranium mining and milling on and near the Reservation has been a disaster for the Navajo People. The Department of the Interior has been in the pocket of the uranium industry, favoring its interests and breaching its trust duties to Navajo mineral owners. We are still undergoing what appears to be a never-ending federal experiment to see how much devastation can be endured by a people and a society from exposure to radiation in the air, in the water, in mines, and on the surface of the land. We are unwilling to be the subjects of that ongoing experiment any longer.

See Attachment 2 at 2. Testimony of the Honorable George Arthur, Chair of the Navajo Tribal Council Resources Committee, before Oversight and Government Reform Committee of the United States House of Representatives, October 23, 2007 (notes omitted).[1]

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[1] Along with Chairman Arthur's testimony, the testimony of several representatives of the Navajo Nation provided to the U.S. Congress at the October 23, 2007 hearing have been included with this

C. Impacts from ISL mining

The ISL uranium mining process does not represent an environmentally benign substitute for past methods of uranium recovery. Indeed, the NRC itself admits that no single uranium ISL mining operation has ever – not even once – restored an aquifer to pre-mining water quality once that aquifer has been mined for uranium.[2]

Uranium solution combines mining and milling in one operation. The method extracts uranium by injecting a solution of water containing an acid or base solution (usually a dissolved oxygen and sodium bicarbonate) into a uranium-bearing rock formation in an underground aquifer. The "lixiviant" solution strips, or dissolves, the uranium (and other heavy metals) from its host rock. "Production wells," located between the injection wells, intercept the "pregnant" lixiviant and pump it to the surface. A centralized ion-exchange facility extracts the uranium and the "barren" lixiviant, stripped of uranium, is regenerated with oxygen and carbon dioxide and re-circulated for continued leaching. The ion exchange resin, which becomes "loaded" with uranium, is stripped or "eluted" of its uranium and returned to the well field facility. The resulting rich eluate is precipitated to produce "yellow cake" slurry. This slurry is dewatered and dried to a final drummed uranium concentrate, the raw material which, when converted to toxic uranium hexafluoride and heated to a gaseous state, is used as "feed" for the plants that enrich nuclear fuel. During the mining process, more water is produced from the ore-bearing formation than is reinjected. This net withdrawal, or "bleed," produces a cone of depression in the mining area, intended to control the fluid flow and confine it to the mining zone.

Solution mining involves drilling and operating hundreds of injection and production wells at each mining site. Usually several hundred injection and production wells are installed at any one mining site. Mining the aquifer to recover uranium in this fashion changes the chemistry of the groundwater: concentrations of uranium in the groundwater are increased up to 100,000 times. Levels of other naturally occurring radioactive elements and heavy metals are increased similarly, making the groundwater in the mining zone unsafe for human consumption or for use in any agricultural setting.

While ISL mining operations are site-specific in both their design and the particular nature of the environmental harms inflicted, there is a consistent set of recurring

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submission in Attachment 2 and succinctly summarize some of the legacy of harms suffered as a result of past uranium mining and milling, including Mr. Larry J. King's descriptions of the Rio Puerco spill.

[2] The NRC has admitted this fact several times, most recently in the Gallup Independent newspaper in New Mexico. Quoting from the August 13, 2007 article by Zsombor Peter, "The NRC's goal, said William von Till, Bureau Chief for the Division of Waste Management and Environmental Protection, is to restore the ground water at mine sites to their original conditions. 'That's a worthy goal,' said University of New Mexico chemist Steve Cabanis, 'but it doesn't seem to be borne out by history.' By von Till's own admission, in fact, it hasn't happened once."

problems with uranium solution mines in the disparate geological areas across the United States (and, indeed, in other countries as well):

- Mining solutions escape the mining areas during operations by flowing rapidly through the thin and narrow channels in an aquifer that has been inadequately characterized;
- Monitor wells intended to detect such "excursions" are often spaced too far apart;
- High levels of uranium and other contaminants in the mining solutions are not diluted by uncontaminated groundwater outside of the mining areas, should an excursion occur;
- All too often, mine sites are too close to historical, currently operating, or potential human or agricultural water wells;
- Restoration to pre-mining, "baseline" conditions has not been achieved at any commercial-scale ISL mine in Wyoming, Texas, or at numerous other sites around the country and the world;
- Restoration at two Texas uranium solution mines was approved in the late-1980s only after the Texas regulatory agency relaxed the cleanup standards for uranium and other contaminants;
- This Texas regulatory agency failed to require that these uranium mining companies post adequate financial assurance to address remediation of polluted groundwater;
- Biomedical studies have shown that uranium is toxic to the human kidney at levels lower than the national drinking water standard and much lower than in the mining solutions;
- Radioactive radon gas released from injection well valves and tanks in the associated processing plants often exceed federal limits and can add to the unhealthy levels of radon in areas where abandoned uranium mines have not been cleaned up;[3]
- Communities are downwind of processing plants that release radon and uranium, and thus increase health risks for local residents.

At a time when many in the nuclear industry allege that our Nation is about to embark on a new round of reactor construction – with an associated spate of uranium recovery – it is incumbent upon the NRC and other relevant agencies to comprehensively address the environmental risks inherent in any expansion of the domestic uranium mining and milling industry, in order to ensure that the licensing process going forward contains sufficient protections that will prevent the recurrence of previous harms to the environment and public health.

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[3] See Attachments 1 and 2 for additional descriptions of this problem.

II. The Legal and Regulatory Framework for Uranium Recovery

A. The patchwork of regulatory authority

Despite the history of environmental and public health harms, the framework for the regulation of uranium recovery is a mishmash of federal and state oversight, with little accountability for lax decisions and a decided unwillingness to enforce protective standards if these would increase costs to the industry. The NRC, the Environmental Protection Agency (EPA), the Department of Energy (DOE), the Interior Department (specifically the Bureau of Indian Affairs under its trust responsibility) all hold portions of responsibility for the regulation of past, present and future harms resulting from uranium recovery.

In the first instance, the NRC does not regulate conventional uranium mining. Rather, the NRC regulates uranium after it has been "removed from its place of deposit in nature" or otherwise chemically altered. This counter-intuitive state of affairs dates back 50 years. The Atomic Energy Act (AEA), 42 U.S.C. § 2011, et seq., requires an NRC license to transfer or receive in interstate commerce any "source material" (that is, uranium ore) "after removal from its place in nature." 42 U.S.C. § 2092. NRC has understood section 2092 as precluding jurisdiction over conventional uranium mining. *See* 63 NRC 510, 512-13 (2006).

The AEA's restriction of the NRC's coverage to uranium milling operations has left several serious regulatory gaps that have essentially remained unaddressed, except in the most piecemeal fashion. Conventional uranium mining operations are regulated partially under various laws, including the Safe Drinking Water Act, the Clean Water Act and the Clean Air Act, thus under the purview of EPA and delegated state authorities. But application of these laws to uranium source materials has significant limitations. As but one example, the Clean Water Act covers only those radioactive discharges which do not fall into the "source, by-product, and special nuclear material" category. See Train v. Colorado Public Interest Research Group, 426 U.S. 1 (1976).[4]

The states that do regulate uranium recovery perform such action either in the absence of federal regulation or in response to federal guidelines. As an example of the absence of federal regulations, surface mining for uranium removes large amounts of overburden (i.e., earth) to reach uranium ore. These piles of overburden invariably contain heavy

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[4] To take another example of this troublesome federal patchwork of laws, in describing the actions of the Interior Department, George Arthur, Chairman of the Resources Committee of the Navajo Nation Council testified: "The Department of the Interior has been in the pocket of the uranium industry, favoring its interests and breaching its trust duties to Navajo mineral owners." See Chairman Arthur's testimony at 2, and Note 4, citing McClanahan v. Hodel, No. Civ. 83-161-M, 14 Indian L. Rep. 3113 (D.N.M. 1978) (invalidating fraudulently obtained uranium leases approved by the BIA and observing that "the BIA and Interior generally seem to have been more concerned throughout the leasing processing with their relationship with Mobil [the uranium lessee] than their relationship with the Indian owners") appeals dismissed, vac. as moot, nos. 87-1186 and 87-1234 (10th Cir. 1988).

metals, radioisotopes, and other hazardous and toxic substances. There are no federal regulations that specifically designed for this issue. The federal Surface Mining Control and Reclamation Act of 1977 covers only coal operations. Certain states have expanded their Mining Acts to cover conventional uranium mining, but treatment of state obligations differ state by state and remain a source of ongoing disputes. See Colo Rev. Stat. Ann §§ 34-32-101 et seq. and compare with NMSA 1978 §§ 69-36-1 et seq. (and see, e.g., New Mexico Mining Commission, et al. v. United Nuclear Corporation, 133 N.M. 8, 57 P.3d. 862 (N.M. App. 2002), where after reviewing the NRC's jurisdiction, the New Mexico Court of Appeals held that the New Mexico Mining Act covers uranium. The court determined that since these agencies never regulated conventional uranium mining per se, the relevant exclusion under the Act should not be interpreted as excluding United Nuclear's operations).

The second serious gap in addressing the environmental impacts of conventional uranium recovery – the regulation of uranium mill tailings – was only partially addressed by the Uranium Mill Tailings Radiation Control Act (UMTRCA). Passed originally in 1978, mill tailings became subject to NRC regulation. UMTRCA amended the AEA and changed the definition of byproduct material under NRC's jurisdiction to include uranium mill tailings.

UMTRCA is divided into two titles. Title I addresses sites that were abandoned by 1978. EPA was directed to promulgate standards for remediation and DOE was to perform the cleanup of abandoned tailings sites (25 former AEA sites) subject to NRC licensing.[5] Title II focuses on facilities operating after 1978 and established the framework for NRC and Agreement States to regulate mill tailings and other wastes at uranium and thorium mills licensed by the NRC at the time of UMTRCA's passage in 1978.[6] To insure the long-term stabilization and maintenance of the mill sites and to pass on industry's costs, ownership of the tailings passes to the federal government (DOE) or the state after the mill is decommissioned. To date, no state has become a perpetual custodian of a uranium mill site.

Returning to the NRC's direct responsibilities, the NRC does regulate the uranium recovery when it relates to milling and ISL mining under its regulations for Domestic Licensing of Source Material. 10 C.F.R. § 40. NRC regulations also theoretically establish radiation protection standards for activities conducted under NRC licenses. 10 C.F.R. § 20.

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[5] As simple proof of the regulatory mess, DOE authority to perform remedial action at these sites – a job which is not yet done – expired in 1998, except for the authority to perform groundwater restoration activities.

[6] States can play a cooperative role by assuming "Agreement State" status under Title II and for other types of regulatory status. States that have licensed ISL mines, for example, include Texas and Wyoming. As an agreement state, a state can assume regulation of uranium mill tailings and can enact rules equivalent to or more stringent than those required by the NRC and the EPA. See 10 C.F.R. § 150.31, requiring state compliance with any standards promulgated by NRC or EPA under UMTRCA.

NRC regulations ostensibly require that after an ISL mining and milling operation has concluded, the site must be cleaned up or "decommissioned" and groundwater quality must be restored. 10 C.F.R. § § 40.42(h)-(k); 10 C.F.R. § 40, Appendix A. The problems that have emerged with groundwater restoration in one ongoing case will be detailed below and provide a clear illustration of the harms and the necessity of a searching NEPA review.

B. The NRC regulatory framework and groundwater impacts

An application to the NRC for a specific license for uranium recovery will be issued and will be approved if, in pertinent part (a) the application is for a purpose authorized by the Act (referencing the AEA); and (b) the issuance of the license will not be inimical to the common defense and security or the health and safety of the public. See 10 C.F.R. 40.32. In its basic regulatory guidance for uranium recovery, the Standard Review Plan (SRP) for uranium milling, the NRC acknowledges the seriousness of groundwater contamination and where issuing a license could be inimical to the health and safety of the public – specifically, elevated levels of metals in groundwater. Thus, the NRC requires licensees to take steps to remediate groundwater under its SRP. See NUREG-1569, NRC Standard Review Plan (SRP), at 6-9. In a pending dispute before the 10th Circuit, the NRC details how it interprets its obligations under the law:

> NRC requires licensees to take "reasonable" steps to restore the groundwater to pre-recovery baseline standards .... If the licensee cannot restore the water to pre-recovery baseline, its primary goal, it must restore the water to either EPA primary standards ("drinking water") or secondary standards of pre-operation "class use" which includes agricultural or livestock use. If the licensee cannot "technically or economically" restore a particular parameter in the water to a secondary standard, the licensee must demonstrate that leaving the parameter at the higher level will not be a threat to public health and safety.

See Attachment 3, NRC Preliminary Response Brief, September 20, 2007, Eastern Navajo Dine' Against Uranium Mining v. U.S. Nuclear Regulatory Commission, United States Court of Appeals for the 10th Circuit, No. 07-9505. (Citations omitted) (cited hereinafter as "NRC brief at __.").[7]

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[7] The ENDAUM v. NRC dispute pending before the 10th Circuit is the result of many years of administrative litigation and it would be superfluous to detail the many complex issues involved in these comments. Such disputes that will not be touched upon in these comments, but which are entirely relevant to the site specific decisions, include how and where the NRC and uranium mining company "set" background levels of pre-mining water quality and when those background levels are set for regulatory purposes. And pertinent to these comments, several of the recent statements and arguments presented by NRC counsel graphically illustrate how NRC interprets its legal obligations and makes clear that a "generic" treatment of NEPA obligations cannot substitute for a searching, "hard look" review.

i. The "Mobil Section 9" example – where the NRC has failed to require compliance with standards in any meaningful way

Despite the hortatory language, the manner in which the NRC has interpreted these requirements has not been protective of public health and the environment. In the ENDAUM v. NRC case, a key dispute has been the adequacy of a remedial action plan (RAP) for contaminated groundwater at the proposed mining site and the adequacy of the associated "decommissioning surety," or in lay terms, the amount of money put aside in escrow to ensure there is adequate funding for cleanup. The NRC technical staff arrived at its decision to base the company's required amount of decommissioning surety on flushing nine "pore volumes" of water through the aquifer.[8] In deciding on nine pore volumes, the NRC staff relied on several tests conducted by the company and, most important, historical data from a prior ISL pilot project called "Mobil Section 9." As demonstrated in the site-specific Final EIS for the Mobil project, almost all of the tests relied on by the NRC failed to restore groundwater quality.

In the Mobil Section 9 pilot project — the largest ISL pilot test and the test deemed the most "applicable" by the NRC's Presiding Officer for the purposes of that license (see LBP-99-30, 50 NRC at 106) — flushing the aquifer nearly 17 times failed to restore groundwater to baseline levels for many of the contaminants, including the toxic and/or radioactive constituents arsenic, radium-226, and uranium. See the Final Environmental Impact Statement for Crownpoint Uranium Project (hereinafter "Crownpoint FEIS") at 4-38, Table 4.13. Despite these dismal results and the obvious comparison that should have been made, the NRC Staff inexplicably concluded that "practical production-scale groundwater restoration activities would at most require a 9 pore volume restoration effort." Crownpoint FEIS at 4-40.

And the NRC's response to this under the relevant standards is even more inexplicable. The NRC recently argued before the 10th Circuit:

> The PO [Presiding Officer] based his groundwater findings partly on an affidavit of William H. Ford, an NRC geohydrologist, who stated that "it is extremely likely that … the groundwater quality will be restored to acceptable levels," and that "most, if not all, of the groundwater parameters will achieve the secondary groundwater restoration goals stated in HRI License Condition 10.21." The PO recognized the uncertainty associated with Mr. Ford's "most, if not all" statement, but observed that only 6 of 26 parameters at the Mobil demonstration failed to meet groundwater restoration goals. Three (calcium, sodium and molybdenum) are "not considered hazardous to humans." The PO found that arsenic, a hazardous parameter not fully restored at the Mobil site,

[8] A "pore volume" is, quite simply, the amount of water that will void space inside a defined volume of rock or sediment in an aquifer. The manner in which the pore volume is calculated and, ultimately, the amount of water that will constitute each pore volume will have an enormous impact on the amount of money that must be set aside as a financial surety for cleanup of the contaminated aquifer.

> was much more concentrated at the Mobil site than at Section 8, but nevertheless came very close (0.079 mg/L) to the primary standard of 0.05 mg/L. For these reasons, the PO found that arsenic restoration would not present a problem at Section 8 [the first of the proposed mining sites in the ENDAUM v. NRC dispute]..
>
> The two remaining parameters are radium and uranium. After weighing the evidence presented, the PO found that failure to meet the primary or secondary groundwater standards for these parameters would not endanger public health and safety at Section 8.

NRC brief at 24-25 (emphasis added, citations omitted, explanatory text in brackets inserted). The NRC went on to note in its presentation:

> NRC chose 9 pore volumes as a reasonable estimate based on a review of the Mobil test data. NRC Staff explained why particular parameters that were not restored to primary or secondary standards at the Mobil project were unlikely to prove a concern at the Section 8 site. The PO found the Staff's explanation persuasive.
>
> Petitioners argue that the AEA will be violated if groundwater is not restored to "pre-mining baseline or drinking water standards." But Petitioners cite no evidence that a restoration failure, even if it occurred, would be a "threat to public health and safety" as opposed to an undesirable but non-safety related environmental impact. In any event, NRC established an initial estimate designed to restore groundwater to either baseline or secondary standards. That was the whole point of the litigation before the PO.

NRC brief at 51 (emphasis added).

Put plainly, in this recent uranium recovery license that is currently being disputed, the NRC established an initial required monetary amount to be set aside as a cleanup fund based on data for a similar site where several contaminants were not restored, either to baseline or to safe levels. Indeed, at the Mobil project, the site used by the NRC as a basis for setting the amount for cleanup the company must set aside, six contaminants were never restored and restoration to achieve even that inadequate level required more than the nine pore volumes required under the license under dispute. See Crownpoint FEIS at 4-33, Table 4.9. NRDC does not have access to the cost data on this matter, but we can guess that as restoration at the Mobil project was not complete after more than fifteen pore volumes were flushed through the aquifer, the cost must have far exceeded Mobil's original estimates.

Despite this history, the NRC Staff – and supported by decisions from the Presiding Officer and the Commission in this particular license – found that "water quality will be restored to acceptable levels." See LBP-99-30, 50 NRC at 106. The NRC's position

renders the existence of baseline or EPA standards meaningless when the agency simply chooses to ignore them.

ii. The NRC has transferred the burden of demonstrating environmental harms to the public and away from the licensee

The NRC compounds the harm of rendering groundwater restoration standards meaningless by the inappropriate and unlawful act of transferring to the intervenor and/or prospective victim of environmental abuse the burden of demonstrating "persuasive" evidence that a licensee's failure to comply with standards would violate the law and pose a hazard to public health and the environment. Note the NRC counsel's statement cited above, "[b]ut Petitioners cite no evidence that a restoration failure, even if it occurred, would be a "threat to public health and safety as opposed to an undesirable but non-safety related environmental impact." This is a preposterous stance for an agency charged first and foremost with enforcement of regulatory standards intended to protect public health and safety. In our view this mission logically subsumes protection of the surface, airborne, aquatic, and underground environments the public relies on for water to sustain itself, livestock, and agriculture.

It is a fact that the regulatory standards were not met at the original Mobil site – the site and a significant portion of the data that provided a basis for the licensing of the currently contested ENDAUM v. NRC site. And, while granting that at this point such positions are still speculative as mining has not yet commenced at the site, NRDC believes that the Intervenors have made a persuasive case that it is entirely unlikely that at this site water can be restored to (1) pre-mining water quality; (2) EPA drinking water standards; and (3) EPA secondary standards of pre-operation use. Yet NRC still sees fit to place the burden on the petitioner to present "persuasive evidence" that public health is at risk. The fact that the standards alone were not met at the Mobil site should constitute a prima facie showing that the public health and environment are at risk. The license applicant—not the ostensible regulatory agency and certainly not the public—should bear the entire burden of proving that a license will not detrimentally impact public health and the environment. The NRC's interpretation of "groundwater protection" effectively turns environmental protection on its head.

iii. The NRC's structure for ensuring adequate money has been set aside for cleanup

And finally, the NRC regulatory structure compounds the flaws in its agency defense of licensing uranium recovery by allowing licensees to proceed with a "phased" surety under the agency's "Performance-Based Licensing." In a phased surety, a licensee funds part of its restoration operations at one wellfield out of the proceeds from its next ISL mining site. This allows the licensee, as the NRC puts it, "to conserve its surety deposit." NRC brief at 53. But this also allows the licensee to pollute one area of the aquifer, commence restoration (that has never once restored a mined aquifer), and have future restoration efforts be contingent upon future mining – which again, will irreversibly contaminate the aquifer. Rather than barring a licensee from continuing to a second site

until the licensee has demonstrated restoration of the groundwater at the first mined site, this "normal" industry practice ensures that the industry must have proceeds from subsequent mining sites to enable "restoration" to occur at all, much less in manner that fully protects pre-existing uses. Thus, the agency and the industry have together created a perfect closed loop system – the licensee can't afford the cost of restoration unless it mines, so it must recover more uranium, an area which will then have to be restored, which of course will demand more mining to cover those costs, and so on.[9] Again, environmental law is turned on its head. Moreover, we detect a blatant departure from NEPA's clear injunction against agency practices that would tend to prejudice or predetermine the outcome of the Proposed Action(s) under agency review. NRC's current pattern and practice with respect to the funding of surety deposits could predispose both the agency and applicants to minimize prospective uranium mining risk posed by new licenses in order to garner the revenue needed to mitigate known environmental harms already incurred. Reasonable alternatives for remedying this systemic violation of NEPA must be considered in detail in the course of any GEIS review of uranium recovery operations.

III. A Generic Analysis is Inadequate to the Site Specific Harms of Uranium Mining and Milling

In contrast to the complicated statutory and regulatory patchwork for uranium recovery operations, NEPA is clear in its well-established mandates. NEPA characterizes environmental impacts broadly to include not only ecological effects, such as physical, chemical, radiological and biological effects, but also aesthetic, historic, cultural, economic, and social effects. 40 C.F.R. § 1508.8. NEPA requires an agency to consider both the direct effects caused by an action and any indirect effects that are reasonably foreseeable. Effects include direct effects caused by the action and occurring at the same time and place and indirect effects caused by the action, but later in time or farther removed in distance, but still reasonably foreseeable. 40 C.F.R. § 1508.8

NEPA directs that NRC take a "hard look" at the environmental impacts of its proposed action, or series of related actions comprising a "program" of action, and compare them to a full range of reasonable alternatives for meeting the agency's purpose and need for agency action that may avoid or mitigate environmental harms or risks posed by its preferred alternative. "What constitutes a 'hard look' cannot be outlined with rule-like precision, but it at least encompasses a thorough investigation into the environmental impacts of an agency's action and a candid acknowledgement of the risks that those impacts entail." Nat'l Audubon Soc. v. Dept of the Navy, 422 F.3d 174, 185 (4th Cir. 2005).

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[9] In the NRC v. ENDAUM matter, the NRC license requires that the licensee "demonstrate restoration" on one mining site before moving to the next. In that instance, background water quality has never been established and the degree to which it has been established is a point of serious contention between the parties. And in light of the history of simply relaxing or even ignoring applicable standards when faced with an entirely consistent failure to restore contaminated aquifers, after the fact license provisions that require "demonstration of restoration" provide cold comfort.

In taking the "hard look" required by law, the NRC must therefore address all the reasons why several commenting parties, including NRDC, believe that the uranium ISL mining and conventional milling create serious environmental and public health harms. Given the environmental record of uranium mining to date and the inherent environmental and public health risks posed by the techniques hitherto employed, we have no basis for concluding that site-specific Environmental Assessments – rather than a full blown EIS for each individual site – will be legally sufficient for the vital task of fully identifying and characterizing the prospectively harmful impacts on public health and the environment posed by uranium recovery operations at specific sites. And we certainly have no confidence that such a truncated process would consider all reasonable alternatives for avoiding, preventing, minimizing, and mitigating these impacts.

The nature of uranium recovery is such that any probing and lawful environmental analysis under NEPA must be site specific. Gross generalizations can be made about uranium deposits – e.g., they generally occur in rollfront and sandstone geologic formations – but any in-depth analysis must be focused on the particular hydrology, geology, and the surrounding communities to be affected by the mining process. In its comments the New Mexico Environmental Law Center has provided detail on the wide variability of hydrology and geology at a number of existing ISL sites. See New Mexico Environmental Law Center comments at 15-16. The NRC itself has stated that "Because of the intensely site-specific nature of the chief environmental impacts from in situ extraction, those involving groundwater contamination, the staff does not consider it of value to do further general assessment of such impacts. NUREG 0706, Vol II, Sec. 1.1, pag. A-11.

Moreover, the potential use of the local water and impacts to affected communities or other industries that might extract from the aquifer will vary widely from site to site. Again, the Law Center has detailed a number of culturally significant sites in New Mexico that will be affected by uranium recovery – culturally significant sites that differ vastly from those that are to be found in Virginia, Michigan, South Dakota, and any of the other states where uranium may potentially be mined. The wide variety of cultural, social, aesthetic and economic resources that could be affected around the country merit scrutiny and a "hard look" that is site-specific.

And finally, the NRC has commenced this process to provide "efficiency" for the industry rather than to fulfill its mandate as an independent regulatory body to safeguard public health and safety. In a May 7, 2007 briefing before the Commission by the Office of Federal and State Materials and Environmental Management, the agency stated:

> We are looking at ways to facilitate the development of environmental impact statements including the use of a generic environmental impact statement for uranium recovery licensing, supplemented by site specific

> environmental assessments to improve our efficiency and address limited resources.[10]

We submit that contouring an agency's legal obligations under NEPA to its perceived need to expedite the granting of licenses and "address limited resources" is itself a violation of the statute, and could well constitute grounds for a "pattern and practice claim" alleging systematic agency abuse of the NEPA statute.

IV. The NRC must define its "Major Federal Action"

To take a lawfully compliant path, as we noted at the outset of these comments, the NRC must withdraw the Uranium Recovery NOI as it has not yet defined a specific proposed action or a related series of proposed agency actions susceptible to "generic" or "programmatic" NEPA review – or indeed announced any concrete "proposal" for action, such as the filing of one or more materials license applications, the granting of which would constitute a "major federal action" triggering the need for prior NEPA review.

The NRC's attempt, prior to the presentation of any new uranium recovery licensing applications, to preemptively employ a vague "generic" NEPA process to assist the uranium mining industry in truncating NEPA review in a manner that makes public involvement substantially less likely, and NEPA review substantially less searching, is plainly illegitimate and unacceptable (e.g., see Att. 3 and the statement noted above on page 13 where the NRC acknowledges supplementation by site specific EAs rather than EISs). Such a course of action is a transparent effort to use the existence of a Generic EIS to expedite and influence the requirements of specific, individual licenses.

As we noted at the outset, we discern no proposed major federal action in the current NOI other than a systemic weakening of the environmental review process that must accompany each and every license application for uranium recovery. Such action is in effect – even if not named explicitly by the agency – an alteration of the agency's licensing rules. If this is indeed the agency's proposal, such action amounts to an alteration of the agency's licensing rules that must be accompanied by a rulemaking proposal and a broader NEPA review of the environmental impacts.

Rather than this attempt to foist on the affected parties a revised NEPA process that would truncate and weaken the environmental review of each specific site proposed for uranium recovery operations, there is another path available. If the NRC were to commence work on a limited (but as yet undefined) set of programmatic issues addressing the serious systemic weaknesses in the environmental reviews of licenses for uranium recovery, the agency could commence work on a scoping process for a PEIS that takes a "hard look" and:

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[10] See Att. 4 at 2, a May 7, 2007 "Briefing before the Commission by the Office of Federal and State Materials and Environmental Management," Statement of Mr. Larry Camper, Director, Division of Waste Management and Environmental Protection, Office of Federal and State Materials and Environmental Management Programs.

(a) performs a full analysis of the broader national purpose and need that would be met by a national program for increased domestic uranium recovery; and the reasonable alternatives thereto;

(b) performs an inter-agency assessment of alternatives for managing the impacts of a national uranium recovery program jointly with the other federal agencies that have related statutory responsibilities;

(c) addresses and identifies the extensive environmental damage from past uranium mining and milling practices;

(d) identifies current and applicable regulatory standards as they relate to management of the specific and serious environmental impacts from a national program of future uranium mining activities and as such; and

(e) identifies – with the aid of the other cooperating agencies – gaps or lack of coverage in statutory or regulatory authority to address and mitigate the environmental impacts of uranium recovery.

Issues that should certainly arise in the course of such a PEIS include NRC proposals for rulemaking (and other publicly identified alternatives) to address the full range of environmental and public health impacts posed by the uranium recovery industry, in particular an orderly setting of binding standards to be enforced, and the elimination of the current fatuous and clearly illegal burden on interveners, when there is prima facie evidence of violation of those standards, to demonstrate direct harms to their personal health and safety above and beyond objective evidence that the applicable standards have not been or in all likelihood will not be met by an actual or prospective licensee.

To undertake this process, and especially in identifying any common statutory or regulatory gaps, consistent with NEPA, the NRC should be prepared to work with other responsible federal agencies in formulating this "hard look analysis." See 40 CFR 1502 (14)(c) (An agency may not reject a reasonable alternative because it is not within the jurisdiction of the lead agency."). See also, NRDC v. Morton, 458 F.2d 827, 836 (DC.Circ. 1972) (The mere fact that an alternative requires legislative implementation does not automatically establish it as beyond the domain of what is required for discussion, particularly since NEPA was intended to provide a basis for consideration and choice by the decisionmakers in the legislative as well as the executive branch."). See also Muckleshoot Indian Tribe v. U.S. Forest Service, 177 F.3d 800, 814 (9th Cir. 1999) (An agency's refusal to consider an alternative that would require some action beyond that of its congressional authorization is counter to NEPA's intent to provide options for both agencies Congress.).

In sum, any attempt at this stage to treat as "generic" issues that will vary significantly from site to site and region to region would obviously prejudice and predetermine the results of the required inter-agency analysis of uranium mining alternatives and impacts –

the scope of which, we repeat, has not yet been properly defined or presented for public comment. And while such a process may or may not correspond to industry's desired timetable for obtaining licenses, the obligation for a searching and lawful NEPA review remains. Moreover, while information about the affected environments at proposed sites, and the aggregate environmental impacts of currently proposed regional facilities may be useful in broadly assessing the environmental impacts of various reasonable programmatic alternatives (as discussed above), there is not enough information known at this stage about the candidate mining and milling sites, or indeed, the regions to be affected, to conduct a valid comparative analysis for each site.

The NRC's attempt in this process to assist the industry and improve the "efficiency" of its regulatory process in a manner that makes public involvement substantially less likely and NEPA review substantially less searching (again, please see the statement on pages 13-14 where the NRC acknowledges supplementation by site specific EAs rather than EISs) is unfounded. Such a course of action is a transparent effort to use the existence of a Generic EIS to expedite and influence the requirements of specific, individual licenses.

This approach is unacceptable from the NEPA legal perspective, and violates common sense notions of objectivity, fairness, and due process. NRDC and others are highly likely to seek judicial redress in the event NRC does not revert to an orderly and appropriate "tiering" of NEPA programmatic and subsequent site-specific documents. Appropriate tiering and sequencing of NEPA decision making will allow, as the law intends, full and fair consideration of program alternatives to proceed.

V. The Alternatives Posed For Review Are Inadequate

The NRC states that the three alternatives to be evaluated include:

> No action – The no-action alternative would be to not build nor license potential uranium milling facilities. Under this alternative the NRC would not approve future license applications. This alternative serves as a baseline for comparison of the potential environmental impacts.
> Proposed action – The proposed action is the construction, operation, and decommissioning of an ISL uranium mill. Implementation of the proposed action would require the issuance of an NRC license under the provisions of 10 CFR Part 40.
> Alternatives—The conventional milling process is one alternative. Other alternatives not listed in this notice may be identified through the scoping process.

72 Fed. Reg. at 61912 and 61913.

The "Purpose and Need for Agency Action" remains incoherently defined in a narrow manner characterized by the provisions of an obvious answer for the agency (and industry) – either move forward with licensing these facilities or not. Courts have long found that tailoring the "Purpose and Need" statement in this fashion to fit precisely the template of an agency's proposed action is inconsistent with the purpose and

requirements of NEPA. There is a lengthy and tragic history associated with uranium recovery and no broad national purpose is identified, no overarching need for the proposed action is stated or weighed against alternative means of accomplishing the agency's purpose and need for action.

In sum, in order to proceed with a legitimate NEPA scoping document, the NRC must, in full consultation with other involved federal agencies, first craft a statement of "Purpose and Need for Agency Action" that relates whatever uranium recovery program it eventually defines to broad national objectives that are within the NRC's purview, including for example, such goals as "improving remediation of land and water impacts from the recovery of source or byproduct materials," or "ensuring the long-term isolation from the human and natural environment of harmful radionuclides and chemical toxins produced in the nuclear fuel cycle." We do not believe that the uranium recovery industry (at least how it has been operated in the past) will be effective in addressing any of these goals, but this prospect is present, at least in theory. We do note, however, that other concrete policy and program alternatives exist that address practical solutions to each of the challenges presented by these objectives, and therefore merit detailed consideration in any NEPA scoping document.

We also note that because of the splintered nature of the legal framework for uranium recovery, for the NRC to properly craft an appropriate "Purpose and Need for Agency Action," the agency will in all likelihood have to work with its federal colleagues at the U.S. Environmental Protection Agency, the U.S. Department of Energy, and the U.S. Department of the Interior to develop a regulatory framework for uranium recovery cleanup and licensing that protects of public health and the environment.

The NRC can commence its own particular portion of the work by focusing on evaluation of ISL uranium mining performance in the past 35 years, including in agreement states like Texas and Wyoming. And consistent with its regulatory obligations under NEPA, the NRC must also define the region or regions where it anticipates significant environmental and public health impacts, the extent of known and anticipated ISL uranium mining and milling in these regions, the timing of these developments, and a plan for licensing and that is adequate to the scale of the task envisioned. And in light of the historical impacts, any initial, programmatic "hard look" at uranium recovery must be followed by subsequent, site-specific Environmental Impact Statements (EIS) for each and every proposed site.

Conclusion

As suggested at the outset of these comments, the NRC should withdraw the current Uranium Recovery Generic NOI because it contains no valid discernible proposal for agency action. The proposed use of vague "generic" environmental impact analysis to truncate future environmental review of licensing applications not yet in evidence is, we submit, an abuse of the NEPA statute and a thinly disguised attempt to avoid a formal rulemaking proceeding that <u>would</u> <u>indeed</u> trigger the kind of searching broad national

review of uranium recovery operations that the NRC and the uranium mining industry have shown no real desire to conduct to date.

On the other hand, should the agency conclude that such a searching, wide-ranging good faith review is merited by the connected and cumulative impacts of past, ongoing, and prospective uranium recovery operations that it has reason to believe will soon be forthcoming, then – after an appropriate inter-agency review by cooperating agencies – it should issue an Advanced Notice of Intent to prepare a scoping document for a PEIS as outlined above. The harms inflicted by the uranium industry on communities and on the environment over the previous half century are significant, and we should not be so foolish or inattentive as to suffer new iterations of the same mistakes. We appreciate the opportunity to comment and look forward to working with you. If you have any questions, please do not hesitate to contact us.

Sincerely,

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SIERRA

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Cover: Cross-country skiers pause briefly to rewax in Mount Rainier National Park, Washington. Photograph by Keith Gunnar.

In Hot Water:

Uranium Mining and Water Pollution

CAROL POLSGROVE

"It gives you a kind of helpless feeling. I cross this contaminated river every day. You have to take what comes because you live here, you work here. I can't just up and move. I'd have to uproot myself—my whole life."

—Mary Sanford, Gallup, New Mexico

POSSIBLY THE WORST U.S. accident involving radioactivity occurred on July 16, 1979. The United Nuclear Corporation's uranium tailings dam at Church Rock, New Mexico, broke and sent 100 million gallons of radioactive liquid and 1100 tons of tailings tumbling down the Rio Puerco. The flash flood flowed about 60 miles, past Gallup and into Arizona, depositing radioactive and chemical contaminants along the way.

The Church Rock dam break is another reminder that the clean-energy image of nuclear power is a creation of pro-nuclear advertising. Uranium, the nuclear fuel, is—like coal—an ore that is dug out of the ground. But unlike coal, almost all the uranium ore is discarded before it becomes fuel for electricity generation. It goes through several steps of refinement; the first occurs when U_3O_8 (uranium oxide, also called "yellowcake") is chemically leached from the ore at a mill near the mine.

However, this process of refinement is far from efficient. When the industry has extracted what uranium it can, most of the radioactive material remains intact. The liquid and solid wastes from that process amount to nearly all of the ore's original bulk and account for 85% of its radioactivity. These wastes are discarded in "tailings piles," heaps that resemble pyramids but are, in fact, walls of radioactive and chemically contaminated sand, often surrounding ponds of radioactive wet wastes. This type of tailings dam has a history of spills, with fifteen occurring between 1959 and 1977.

The hazards of abandoned dry tailings are notorious. Carcinogenic radon gas from these piles wafts across the country, but air is not the only mode of transport for radioactive substances. Radium and other byproducts of the milling process can seep into groundwater beneath tailings piles. A sudden thunderstorm can send liquid tailings over or through the containing walls to flood fields or flow into streams.

Aside from accidents like the Church Rock dam break (not the first of its kind) uranium companies in business as usual—mining, milling and exploring—routinely consume and contaminate water. Uranium is used as a nuclear fuel because it is chemically active, highly unstable and quick to change form, from uranium-238 through thorium to radium-226, radon-222, the "radon daughters," and eventually to stable lead-206. Uranium is readily soluble, so much so that conditions have to be just right for it to settle down in host rock, as it has in the Rocky Mountain region where most of the nation's uranium is mined (New Mexico and Wyoming together account for almost 80% of production). There uranium rests in aquifers, water-bearing layers of rock, until miners move in.

When miners sink shafts into the ground, uraniferous minerals, as well as minerals containing such toxic elements as selenium, may migrate and, in contact with other chemicals, change into more soluble compounds and dissolve in the groundwater. Miners pump out this contaminated water, because the deposit must be dry before the uranium can be dug out. After purifying the pumped water until it is clean enough, by government standards, for animals to drink, the mining companies dump it into arroyos, dry stream beds, altering abruptly the quantity and quality of surface flow in that area.

According to an EPA study, radium concentrations in mine discharge "increase substantially" during mining. "Whereas natural background radium concentrations are generally about several picocuries/liter (pCi/l), 100 to 150 pCi/l appear in the effluents of operating mines. The discharge of such highly contaminated mine effluents to streams and seepage from tailings ponds create a long-lived source of groundwater contamination."

Water discharged from uranium mines is no mere trickle. In New Mexico, where about half of the nation's uranium has been mined, the discharge amounts to roughly 50,000 acre-feet a year, enough water to supply a town of 50,000 people. To those who live near uranium mines, the withdrawal of water from the aquifers has another effect: the water level in their wells gradually begins to drop.

Although uranium companies have begun to drill new wells to replace those exhausted by mining, this is a short-term answer to the immediate needs of local residents. One uranium company consultant predicted that the "drawdown" from one mine alone would spread over several counties and affect water supplies for at least 150 years after the mine closes.

In arid states, water discharged from the mines is water lost for the foreseeable future, since almost all of the discharge evaporates in dry air or is used by thirsty plants or seeps into previously contaminated streambeds. The water is, in effect, "mined" along with the uranium—consumed by the industry, a thorny political fact in western states, where water rights are subject to constant court

battles and unremitting legislative struggles.

In New Mexico, where the legislature only recently granted the uranium-mining industry the official right to dewater aquifers, the state engineer maintained that dewatering is not wasteful, because the dollar value of uranium produced per acre-foot of water is "about twenty times the value that a good farmer could produce using the same amount of water for irrigation."

Even where uranium is not mined, uranium companies still contaminate water. To find uranium, which occurs in pockets rather than in long seams like coal, companies drill holes. First they drill holes to find deposits, then they drill to determine their outlines. In 1978, uranium explorers drilled a record 47 million feet of holes (average depth: 450 feet). Each time they drill a hole, they run the risk of creating channels for water to move from one aquifer to another, so that the water can be contaminated with uranium either naturally or as a result of drilling.

Some of the consequences to water of uranium mining, milling and exploration will not occur for decades or even centuries, because groundwater moves slowly and because some radionuclides have long lives. As William Ramsay pointed out in a Nuclear Regulatory Commission (NRC) study, "Radium itself, with a half-life of 1600 years, is a long-term problem, but even more serious, the radium is continually replenished as a decay product of the isotope thorium-230, which has the relatively long half-life of about 80,000 years."

But we do not have to wait for evidence that uranium production damages water systems. In the last fifteen years, federal reports have told of:

- seepage from tailings ponds at Edgemont, South Dakota, moving into Cottonwood Creek and the Cheyenne River;
- a company operating a mill in New Mexico's Grants Mineral Belt injecting several billion liters of waste into the ground and failing to monitor its movement into shallow aquifers from which drinking water is drawn;
- effluents from mines and mills increasing radium levels at points throughout the Colorado River system.

The single most dramatic incident of contamination, the Church Rock dam break, focused attention on the carelessness with which the uranium industry disposes of tailings, and on some government agencies'—especially the state's—indifference to that carelessness.

As at Church Rock, companies have often deposited tailings in dry stream beds, common in western areas, where most streams run only part of the year. Although diversion

Gail Russell

A sign in three languages—English, Spanish and Navajo—warns people to stay away from the contaminated Rio Puerco. But cattle can't read.

channels are cut around the tailings ponds, the procedure practically invites trouble. Even after the Church Rock break, a New Mexico company called Bokum Resources had the audacity to propose a plan for a new tailings pond in a stream channel near Marquez. Furthermore, the company started building its mills and dams before it received a state permit, a common practice in New Mexico.

While government regulation of tailings has been half-hearted, the 1978 Federal Uranium Mill Tailings Radiation Control Act gives legal mandate for stiffer control. Although the act still allows states the choice of regulating tailings under state or federal authority, the federal expectations will be higher than they have been in the past. There is reason to hope new tailings piles will at least be built with clay or synthetic liners to block seepage and located where they will not wash away in the near future.

Regulation of mining, unfortunately, is another story. Protecting the quality of water affected by mining has been left largely to understaffed state agencies bound by standards set under the Federal Water Pollution Control Act. These agencies are also subject to a good deal of pressure from the mining industry. In a recent major report on uranium development in the San Juan Basin region, where the uranium-rich Grants Mineral Belt is located, the Department of the Interior examined the loopholes in water regulation. Among them: no law applies to such "non-point sources" as runoff from mine spoils (waste rock dug out to get to the ore) even though, the report notes, these are significant sources of pollution.

Concluding that the federal law is adequate to protect water *if* it is backed up by state law and enforcement, the Interior Department report also concluded that the law, applied to uranium mining, "has not prevented pollution in the past."

Some companies have argued in court that the federal water law should not apply to mine discharge because it does not enter "navigable waters." Brenda McBride, an outspoken member of the Grants-area soil and water conservation board, calls this double-speak.

"The arroyo doesn't carry water anymore and the mountain doesn't shed water anymore. Then it doesn't carry radon daughters that the cows won't eat." Angered by companies' request that the state allow a higher level of selenium in groundwater, she summarized the industry's position this way: "If it exceeds the minimum allowable standard we'll raise the standard, and then we won't exceed it."

On the Navajo reservation not far from Grants, several wells were shut down because the amounts of selenium and arsenic exceeded standards for safety. A number of wells in the area have radioactivity levels that approach federal limits. These high levels could be natural, or a possible result of local mining. The industry can maintain that the water is naturally contaminated since there are no pre-mining baseline measurements to indicate otherwise. Monitoring water quality around mines and mills has been generally unsystematic and indifferent. At the Anaconda Jackpile mine near Grants, the world's largest uranium surface mine for almost 30 years, regular monitoring of air and water quality began only a few short years ago.

Careful monitoring becomes particularly important when uranium is mined by the *in situ* methods now being introduced at Rocky Mountain sites—pumping chemicals into the uranium deposit and pulling the uranium and chemical solution out through wells. On the Navajo reservation, where an *in situ* operation was being installed, Harold Tso, the tribe's environmental officer, questioned whether monitoring the wells would really work. "We don't know if strata are continuous," he said, and added, "If the contamination is from the *in situ* operation, how do you successfully decontaminate a polluted aquifer?"

In Wyoming, they are not sure that you can. The NRC recently shut down Wyoming's first commercial-size *in situ* operation briefly after chlorides, uranium and ammonia were detected in test wells. Then Wyoming Minerals Corporation was allowed to start up again with a different leaching mix, but without completely cleaning up con-

Disaster at Church Rock: The Untold Story

ALLAN RICHARDS

ON THE MORNING of July 16, 1979, a twenty-foot section of a uranium tailings dam at the United Nuclear Corporation's uranium milling operation in Church Rock, New Mexico, collapsed, spilling nearly 100 million gallons of radioactive liquids and 1100 tons of solid contaminants into the Rio Puerco. Though an emergency was not declared by the state of New Mexico or by the federal government, officials for the Nuclear Regulatory Commission (NRC) declared it "the worst incident of radiation contamination in the history of the United States."

Hours after the contaminants crashed through the walls of the dam and surged downstream toward Arizona, causing the normally low Puerco (or "Perky," as it's called by locals) to overflow its steep banks, a sampling of the river made by the New Mexico Environmental Improvement Division (EID) indicated that the level of radium was 120 times above normal; thorium (one of the most potent of all radioactive elements) was 6000 times higher than normal; and such toxic heavy metals as arsenic, selenium and sulfur also greatly exceeded acceptable standards.

The high acid content of the tailings quickly gave the river an acidity equivalent to that inside a car battery. The concentration of thorium 36 miles downstream was as high as it had been in the reservoir before the dam gave way. Within weeks, tests made at a monitoring well fifteen miles downstream near Gallup, a city with a population of 21,000, revealed that high levels of radioactive and heavy-metal contaminants had already seeped 30 to 40 feet below the surface into the groundwater.

All along the Puerco, signs were posted in three languages—English, Spanish and Navajo—by the New Mexico EID to "discourage" people from using the water. Yet fences were not erected to prevent Navajo livestock, which traditionally drink from the Puerco, from continuing to do so.

Although the EID, the Nuclear Regulatory Commission and the United Nuclear Corporation claim that the spill cleanup has been effective, a test made this past April of a well supplying drinking water to the Puerco School District in Sanders, Arizona (about 60 miles downstream from the mill), showed a sudden and dramatic rise in radioactivity. A subsequent test indicated that the levels were "at the normal federal guidelines for radioactivity in drinking water," and the first test was termed "anomalous"—a fluke. Ed Swanson of the Arizona Bureau of Water Quality Control says that the agency is "anxious about the incident—we just don't know when or where we're going to get some kind of reaction from the Church Rock spill."

Until recently, neither the government nor the industry itself enforced safety regulations protecting miners from uranium and its poisonous cousins. The legacy of this negligence has shown up in the luckless miners; more than 20% of them have developed lung cancer. In addition, mining companies were permitted to stack tons of radioactive tailings in New Mexico, South Dakota, Arizona, Wyoming and Colorado. In areas such as Grand Junction, Colorado, and Cottonwood, South Dakota, people, not knowing that the tailings piles were radioactive, hauled the solid wastes away to use in building schools, churches and houses. The result: an increase in babies with congenital defects, born to mothers living and working in those buildings, and in Grand Junction, an abnormally high incidence of leukemia.

Contaminants from the spill have already reached the Little Colorado River, and it's only a matter of time before the radioactive elements work their way into the Colorado River and Lake Mead, major sources of drinking water for the southern California area.

The state of New Mexico and Congress have investigated the Church Rock spill. The EID, the NRC and the United Nuclear Corporation have assured the public that the incident was actually minor in scope and that "there is no immediate danger to human health." (UNC is also responsible for a plutonium explosion in Pawling, New York, that contaminated a nearby lake.)

The most shocking thing about the Church Rock spill is that Church Rock was supposedly the best uranium tailings dam built in New Mexico, heralding a new era of safety in the uranium industry. But previously unpublicized geological factors contributed to the dam's failure. And the dam was used for 25 months instead of the 18 it was intended for, and was overloaded by 50% of its design capacity. Aerial photographs taken by the EID in March 1978 and May 1979 show that UNC operated the tailings pond incorrectly: liquids were in contact with the face of the dam instead of a beach of sand tailings. This is a crucial point; the lack of a sand barrier allowed contact between what UNC calls "an untimely presence of free liquids" and the earthen dam.

If the UNC was negligent in complying with building standards for the dam, the state of New Mexico was also remiss in licensing and inspecting it. The state, like UNC, completely ignored the instability of the dam site in its evaluations of the company's construction proposal. During construction and operation of the dam, periodic inspections by the state were never made.

Following the spill, UNC initiated a cleanup operation of the radioactive solids from the Rio Puerco. Six to ten workers equipped with shovels and 55-gallon drums were assigned to scoop the 1100 tons of solid contaminants from the riverbed. Charles Ofelt, official spokesman for UNC, claims, "It was difficult getting heavy equipment into the river because of the wet conditions and the high soft-rock canyons and we therefore had to go in with shovels . . . but we're satisfied with the way it went."

However, because of this bucket-and-shovel approach, and rain within the first two weeks after the spill, the contaminants dispersed quickly and were too difficult to reclaim. The contamination was already present 75 miles downstream and was widely distributed into groundwater by the time the state decided that the cleanup was ineffective and ordered UNC to increase its workforce in the river to 40 men. Only about 0.3% of the material spilled was ever removed from the river.

An informed source familiar with EPA activities, who worked on the post-spill monitoring of river water, offers a sobering appraisal: "The great problem in the collecting and analyzing data has been that there is a real lack of experts capable of accurately and honestly interpreting what the information means. Most officials just don't have any idea how dangerous the contamination is. There's been a lot of head-scratching going on." □

Allan Richards has written for Rolling Stone, Mother Earth News *and* Crawdaddy. *He lives in New Mexico, where he is associate editor of* Taos *magazine.*

taminated aquifers. *High Country News*, an environmental newspaper published in Lander, quoted one state official as saying, "That area is so messed up it may never get back to normal."

In its 1979 generic environmental impact statement draft on milling, the NRC offered bland reassurances derived from mathematical models and a string of optimistic assumptions. The experience of citizens and officials who live and work in uranium-producing regions casts doubt on those reassurances. Thus far, uranium's real, dirty past offers little support for a hypothetical clean future.

A local anti-uranium movement has become active in uranium resource areas. In New Mexico, a county organization led a partially successful battle to block operation of the Bokum mill, and the residents of the Navajo Indian reservation joined with Friends of the Earth in a suit to halt all uranium mining until more environmental impact statements have been prepared. Voters in Vermont and some parts of South Dakota and Wisconsin have approved moratoriums on uranium mining and exploration. Last year, a seven-year ban on uranium mining and exploration in British Columbia, Canada was imposed, following lengthy hearings by an investigatory commission. Much of the credit for this victory goes to the Okanagan Group of the Western Canada Chapter of the Sierra Club. And the Black Hills Group of the Dakotah Chapter has been particularly successful in exposing and halting uranium mining in the area. For more information, contact:

Western Canada Chapter Chair
1410 Evergreen Road
Campbell River, British Columbia
Canada V9W 3S2

Black Hills Group
Dakotah Chapter
P.O. Box 1642
Rapid City, South Dakota 57709

Although many organizations are part of the anti-uranium network, two are particularly important bases of activity and information:

Southwest Research and Information Center
P.O. Box 4524
Albuquerque, New Mexico 87106

Black Hills Alliance
P.O. Box 2508
Rapid City, South Dakota 57709 □

Carol Polsgrove is a freelance writer in Oakland, California.

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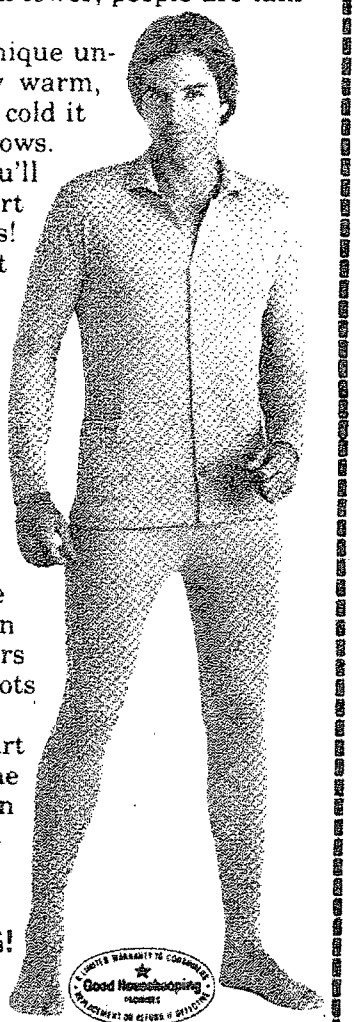

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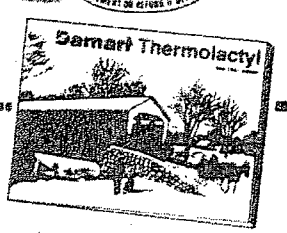

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Attachment 2

TESTIMONY OF THE NAVAJO NATION FOR THE
HOUSE COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM

GEORGE ARTHUR, CHAIRMAN
RESOURCES COMMITTEE
NAVAJO NATION COUNCIL

October 23, 2007

Thank you Chairman Waxman and members of the Committee. I am George Arthur, Chairman of the Resources Committee of the Navajo Nation Council. The Resources Committee oversees the Navajo Nation's mineral and water resources and the Navajo Nation EPA. I speak here as the representative of the Navajo Nation Government.

Few members of this Committee are from the West. Many may not have ever been to an Indian reservation like the Navajo Reservation. I would like to give you a flavor of my land and culture.

The Navajo/federal relationship is based on two treaties, the second one signed in 1868 after about one-third of my ancestors died in a federal concentration camp. Navajo Indian country now includes about 17 million acres in Arizona, New Mexico and Utah. Navajo land is blessed with mineral resources, but the Navajo people have not benefitted much from these minerals until recently, because the Navajo Reservation has served, in the words of a Government study, as an "energy colony" for the United States.[1] Navajo warriors have served the United States with distinction in all major conflicts since World War I.

The Navajo Nation is not a rich tribe. Because of federal neglect and historic discrimination by the States, the Navajo Nation had an infrastructure deficit of 3.7 billion dollars in 1975,[2] and that deficit is much larger now. We have few paved roads, few hospitals or clinics, and substandard schools. Many of our people lack running water and electricity. Unemployment

remains at about 50%.

The Navajo Nation has no casinos, nor the surrounding affluent population needed for substantial gaming revenues. We rely on the land and the scarce water resources available to us. We live, and will continue to live, within the four sacred mountains.

We have maintained our language and traditions, including one where the umbilical cords of Navajo babies are buried in the land of their parents. The Navajos' ties to the land where they are born is profound. We don't just move when conditions become difficult. As a federal district court observed in a case where the United States unsuccessfully sought to relocate a Navajo woman from land where she had lived all her life, relocating a Navajo from her ancestral land "is tantamount to separating the Navajo from her spirit."[3]

Uranium mining and milling on and near the Reservation has been a disaster for the Navajo people. The Department of the Interior has been in the pocket of the uranium industry, favoring its interests and breaching its trust duties to Navajo mineral owners.[4] We are still undergoing what appears to be a never-ending federal experiment to see how much devastation can be endured by a people and a society from exposure to radiation in the air, in the water, in mines, and on the surface of the land. We are unwilling to be the subjects of that ongoing experiment any longer.

In legislation passed in 2005, the Navajo Nation Council made detailed findings about the devastation caused by uranium mining and processing. We found that

> the social, cultural, natural resource, and economic damage to the Navajo Nation from past uranium mining and processing is ongoing due to (i) the continuing need for full monetary compensation of former Navajo uranium workers and their family members for their radiation and mining-induced diseases, (ii) the presence of hundreds of unremediated or partially remediated uranium mines, tailings piles, and waste piles located in Navajo Indian Country, and (iii) the absence of medical studies on the health status of [Navajos] who live in uranium mining impacted communities.[5]

Because of these and other findings, the Navajo Nation has banned uranium mining and processing within Navajo Indian country.

Many of us were and are directly affected by uranium mining and processing in Navajo country. The largest release of radioactive contamination in the United States occurred in the Churchrock Spill, where 94 million gallons of radioactive sludge from a United Nuclear Corporation facility poured into the wash that Navajo people and livestock used and now use in their daily lives. I myself was present in Shiprock (the largest community on the Reservation) in the late 1970s when federal officials decided simply to pile up all the radioactive mill tailings on land near the center of town with no lining under the wastes and a lot of rocks on top to limit erosion.[6] In what other town would the Government allow this to occur and remain?

Under today's environmental laws, it is practically impossible to construct a municipal solid waste landfill, one that takes ordinary household wastes, without a liner to protect underground aquifers used for drinking water. In Tuba City, however, an open dump and mill tailings piled up without a liner, like those in Shiprock, pose an immediate threat to the main aquifer in the Western Navajo area. The Government has devoted the money needed to remove similar tailings from a rural area near Moab. Are those people or their water resources more valuable than Navajos?

I regret to say that the federal EPA, BIA, DOE and NRC would be doing virtually nothing to protect the Navajo people and the Navajo environment at Tuba City, Churchrock, and other locations in Navajo country if the Navajo citizens and their government had not acted. This federal neglect and environmental injustice must stop. The Navajo Nation has six specific recommendations that we firmly believe should be adopted and implemented by the Congress through legislation. These are set forth as an attachment to my written statement, and I will be

pleased to discuss them with the Committee.

Thank you for this opportunity to speak with this Committee, Mr. Chairman.

ENDNOTES

1. U.S. Commission on Civil Rights, The Navajo Nation: An American Colony (1975).

2. Id. at 42.

3. United States v. Tsosie, 849 F. Supp. 768, 775 (D.N.M. 1994), aff'd, 92 F.3d (10th Cir. 1996).

4. McClanahan v. Hodel, No. Civ. 83-161-M, 14 Indian L. Rep. 3113 (D.N.M. 1987) (invalidating fraudulently obtained uranium leases approved by the BIA and observing that "[t]he BIA and Interior generally seem to have been more concerned throughout the leasing processing with their relationship with Mobil [the uranium lessee] than their relationship with the Indian owners"), appeals dism'd, vac. as moot, nos. 87-1186 and 87-1234 (10th Cir. 1988).

5. Resolution no. CAP-18-05 (April 19, 2005) § 3 (amending 18 N.N.C § 1301(E) (2005).

6. Federal officials use the pile for training heavy equipment operators.

TESTIMONY OF LARRY KING

Good morning honorable members of this Committee and honorable Chairman Waxman.

My name is Larry J. King. I am fifty years old. In the Navajo clan system Edith Hood, sitting here at the table with me, is my sister. I was born and have lived all of my life in a traditional Navajo community called Church Rock Chapter, which is located a few miles northeast of Gallup, New Mexico. In the Church Rock area, we raise sheep and cattle in the traditional Navajo way. I still raise cattle on the land my father left to me and my two sisters.

Between 1975 and 1983, I worked for United Nuclear Corporation (UNC) as an underground mine surveyor mill worker. I am currently employed as a water system technician. I have been active for my community on uranium issues for the last ten years.

Church Rock and its neighboring communities of Pinedale, Coyote Canyon and Iyanbito have suffered widespread impacts of past uranium mining. As you've already heard, the biggest spill of radioactive wastes in United States history occurred in our community on July 16, 1979 — only about two miles from where I live. The contaminated fluids that escaped from the UNC uranium mill tailings pond ran right through our property, in the Puerco River, where we watered our livestock. I remember the foul odor and yellowish color of the fluids. I remember that an elderly woman was burned on her feet from the acid in the fluid when she waded into the stream while herding her sheep. Many years later, when water lines were being installed in the bed of the Puerco, I noticed the same odor and color in a layer about eight feet below the stream bed. To this day, I don't believe that contamination from the spill has gone away.

Our community also continues to suffer from the poisons left from the mining operations that began in the early 1950s. There are about 20 abandoned uranium facilities in the Church Rock area. More than half of those were developed by companies that sold uranium ore to the U.S. Atomic Energy Commission for use in the nation's nuclear weapons program, and have not been cleaned up.

I think many of us knew in our hearts that we lived in a contaminated area. But it wasn't until 2003 when the Chapter started the Church Rock Uranium Monitoring Project, or CRUMP, that we found out how bad the problem was, and still is. With the assistance of many outside organizations and agencies, we sampled our air, water, and land. I submit for your record a copy of a recent PowerPoint presentation that summarizes many of the CRUMP findings. Let me tell you about just two of them in the time I have today.

The first is that the Old Churchrock Mine, which is located within one-quarter mile of my home and the homes of my two sisters, remains highly contaminated and has never been properly cleaned up. In the CRUMP survey, which I was trained for and participated in, we found high levels of gamma radiation — up to 16 times what is considered normal for the area — outside of mine site, even on my grazing land, which is immediately adjacent of the mine.

The Old Churchrock Mine was once operated by Phillips Petroleum Company and UNC. It is now occupied by Hydro Resources, Inc. (HRI), which has received a Nuclear Regulatory Commission license to build and operate a uranium in situ leach mine there. Two years ago, the NRC ruled that radiation from the site doesn't have to be included in public dose calculations, that the wastes there are now part of "background,"

as if the Great Spirits had placed them there from the beginning of time. NRC said it doesn't regulate *mine* wastes. I guess its mandate to protect the public health and safety just doesn't apply to we Navajos.

The second major finding of our CRUMP study was that soils around some of the homes of my relatives in the Red Water Pond Road area, where Edith Hood lives, were also contaminated with high gamma radiation levels and with uranium in amounts up to thirty times what is considered natural. Two abandoned mines lie on both sides of this community. One, the Northeast Churchrock Mine, was operated by UNC and is now owned by General Electric Company. A Navajo residence is 500 feet away.

As Edith Hood will tell you in her testimony, there is much sickness among the residents of her community — cancers, kidney disease, miscarriages. We believe that all these illnesses are related to the past mining and milling operations, but it's difficult to prove because no comprehensive health study has even been done in our community.

My own family suffered during the uranium era. One of my uncles and his in-laws were killed when their car collided with a uranium ore truck on State Highway 566 about a mile south of the UNC mill in 1975. Two years later, my brother was killed in a head-on collision with a uranium ore truck at the gate to the Old Churchrock Mine.

As a former underground mine surveyor for UNC, I often worry about my own health. I am not and never have been a smoker, but in the past year, I have developed breathing difficulties. My doctors can't find anything wrong with me — yet. I don't have enough time to tell you how bad the conditions were for the workers at UNC and how the company was not concerned about the safety of its employees. I will tell you

that as a kid, I played on the big piles of ore and mine waste across the road from our home, unaware of the dangers.

On behalf of my community and my family, I beg that you do something to end this horrible experiment that the nuclear industry and the United States government have been carrying out on the health of the Navajo people. I beg you to support our Navajo law and order the NRC to deny permits to companies that want to mine uranium in Navajo communities again. Many of elderly do not speak English, but we all know that what is happening is wrong. Please help us see that justice is done for our people and our communities.

Testimony of Ray Manygoats

My name is Ray Manygoats. I am 53 years old. I live near Tuba City, Arizona, on land that my family has lived on for many generations. A uranium mill was built near our home and the homes of other family and community members when I was a young child. My father and other family members were recruited to work in the mill. They had no training or background in the processing of uranium. The Rare Metals Corporation of America promised to train my father and other family members and to keep them safe, but these promises were lies. The company failed to protect my father and the other workers. I am told that the Department of Energy, the United States Environmental Protection Agency, and the Bureau of Indian Affairs all have promised to guard our health and make sure that we would not suffer from the consequences of uranium mining and processing. But our land today is poisoned. Today, I am a man who has lost his health, his family and his ancestral way of life because of uranium. I am here today to ask you act today to stop the suffering and needless deaths of my people.

On our homeland near what is now called Tuba City, Arizona, we cared for our grandparents, herded sheep, planted vegetables and raised our children. As a young boy, I remember seeing the Rare Metals Mill, which had been built across the highway from our home. My father was recruited to work at the mill. The company provided him with a uniform that he was asked to wash at home. When he would come home each day, he was covered with a thick yellow dust. Each day we would wash his uniform. To wash

the uniform, we would gather water near the uranium mill. We scrubbed but the uniform was always yellow with the dust.

The Rare Metals Mill had no fence around it. Our horses, sheep and livestock would graze on the grass growing in and around the mill. We planted and ate food grown in the area. As we had done for generations, we made use of what we found around us. We cooked on grills my father brought back from the Mill. These grills had been used to sift the yellowcake uranium. My father also brought home large metal drums from the mill. We played in the drums and used them to store our food and belongings.

My brother Tommy and I would often bring lunch to my father at the Mill. Yellow stuff was always everywhere. We saw liquids bubbling and tried to stay away from it. But one day, my sister Daisy walked through one of the open ponds near the mill and burned her feet.

We would play in the yellowcake sand at the mill, jumping and rolling around in it. We also found many small metal balls at the mill. The balls were used to crush and process the uranium. We played marbles with them and had contests to see how far we could throw them.

My father began to have trouble breathing. His breathing troubles never went away, even after the mill was closed. I have always had problems with my ears and eyes. I have had surgery three times to remove growths from my eyes and often have sores on

my ears. Many of my sisters and brothers also have had problems with their eyes. I lost my mother to a cancer that grew in her lungs and throughout her body. Another family member, Lucille, was never able to grow hair and has worn a wig all her life.

Today I still live in the same area, the land of my family. The Mill is no longer operating, but the waste from the Mill is everywhere. Today I walk the land and see streaks of yellowcake uranium in our washes and our topsoil. It is always windy and the wind blows the earth into the air. I see the uranium marbles of my youth in areas where trucks dumped materials and waste from the mill back across the highway into our land. I see in the ground old rusting chemical drums and cables that once were used to operate the mill.

We know now that we are sick because of the uranium. Now people come with machines called Geiger counters and they click and make noises. The noises tell me what I already know: that my family's land is poisoned. But no one helps us to remove the poison. I am here on behalf of my community to ask for your help. To ask that we move past promises to actions. Actions that may save our children from the sickness and the poison that we are now living with.

Testimony of Stephen Etsitty

My name is Stephen Etsitty. I am a member of the Navajo Nation and the Executive Director of the Navajo Nation Environmental Protection Agency. It is my privilege to be here this morning representing the Navajo people and the Navajo Environmental Protection Agency.. The "legacy" of past uranium mining and processing blankets the Navajo Nation from the Eastern Agency communities of Smith Lake and Ambrosia Lake, to Church Rock, near Gallup, on up to the northern region near the four corners area that includes the Navajo communities of Shiprock, New Mexico and Cove, Arizona, across the beautiful Chuska mountains to my home area of Lukachukai and from there westward to Tuba City and Cameron, only a few miles from the Grand Canyon. All of those areas, all are a part of what we refer to as Diné Bikeyeah, and all have suffered and continue to suffer the health and environmental impacts from past uranium mining and processing.

This unfortunate legacy resulted from several past activities, uranium exploration, the mining of uranium, either underground or open pit mining, and the processing of the mined uranium done at facilities producing yellow-cake for the United States nuclear weapons arsenal. The legacy lingers due to the current slow pace of cleanup of known contaminated sites.

There are four former uranium processing sites spread across the Navajo Nation at Church Rock, Shiprock, Mexican Hat and Tuba City. All of these sites were decommissioned by the United States government, meaning that the radioactive mill tailings were capped with clay and rock and left in place at or adjacent to the former mill site. None of the sites were lined meaning that there was nothing placed underneath the

radioactive materials to keep the radioactive waste from leaching into the groundwater, and, we believe that is exactly what is happening today. We know there is radioactive and chemical groundwater contamination under all of these sites and that in Tuba City and Shiprock the contamination is moving towards municipal drinking water wells. We know the federal government is working on that contamination and claims that things will be better in twenty or thirty years. We also know that it would be extremely difficult, if not impossible to construct a solid waste, not to mention a hazardous waste, landfill in your home state today in accordance with current environmental laws and regulations unless that landfill was built with a liner to protect the underlying groundwater. Yet, in my homeland, the Navajo Nation, we have what amounts to four unlined radioactive waste dumps threatening our groundwater.

Not one of the four mill sites have been properly remediated with contaminants removed from the living areas of the Navajo. As we gather mounting evidence that these unlined landfills seep uranium waste into our groundwater, we watch the federal government dig up and properly remediate a similar site located near Moab, Utah, which is outside the borders of the Navajo Nation. Why is this not happening on the Navajo reservation? Are we seeing environmental injustice in action once again?

With reference to former uranium mining we know that there are over 600 former uranium mining sites either on or within one mile of Navajo lands and that there are over 1200 site features, such as contaminated waste piles, associated with these sites. Although many of these site features have been reclaimed, meaning that mine shafts have been sealed and other physical site dangers addressed, only one of the abandoned mine

sites has been thoroughly assessed in accordance with U.S. EPA Superfund program protocols and that assessment has only been completed within the past year.

Waste from the mines and mills found their way over the years throughout the Navajo Nation. Radioactive building materials have been found in Navajo homes. Grazing animals sip water from contaminated ponds. A public highway, state road 566, became contaminated with radioactive materials spilling from mining trucks.. A Geiger counter held while driving that highway today will click and scream, revealing a radioactive public transportation corridor.

But these statistics alone do not tell the full story. I'd like to share with you two stories which illustrate the efforts being made by the Navajo people to address deadly contamination that has been largely ignored by the U.S. government. The stories involve the communities of Tuba City, located near Flagstaff, Arizona and Church Rock, located near Gallup, New Mexico. I will start with a demonstration involving samples of radioactive contaminated soils we've had shipped here from the Tuba City/Rare Metals UMTRCA site. These samples were obtained by our consultant Dr. Bill Walker. Navajo EPA was left with no choice but to initiate its own site investigation, thereby depleting limited Navajo funds, after U.S. EPA refused to move forward with its own assessment of the area. Let me demonstrate for you how we detect radio-active contaminates in soils. The report we brought here with us is Dr. Walker's report and it alone has allowed us to move forward to begin a more thorough environmental assessment in the Tuba City area. We're leaving you some copies not only for its scientific content, but also as a symbol for the fact that any progress occurring in both the Tuba City and Church Rock areas results from Navajo initiative, not federal initiative.[Demonstration]

The sounds that you have heard come from an instrument called a Ludlum 19 and show that Navajo families are living within a few hundred yards of materials that we're told we shouldn't be exposed to for longer than an hour.

So the story about Tuba City is that it took Navajo funds, Navajo EPA employees and Navajo local residents to get U.S. EPA's attention and get them to admit that something needs to be done to protect Navajo citizens.

The same thing happened in Church Rock. Local Navajo residents were able to wrestle a small grant from a non-profit organization and initiate the Church Rock Uranium Monitoring Project (CRUMP). Think about that. Lacking a properly-funded U.S. EPA investigation, local Navajos took it upon themselves to carry radiation detection devices across former uranium mining and processing sites. As a result of their work and with the help and encouragement of the Navajo EPA, U.S. EPA finally recognized the need for emergency action and recently completed the excavation of approximately five to six thousand cubic yards of radium contaminated soils located next to, and in some cases inside of Navajo residences. That's the good news. The bad news is that 300,000 cubic yards of the toxic waste remains on site.

Both of these stories involve problems that are just now beginning to be addressed. I'm sure you understand that for the families living next to these toxic substances it's difficult for them to see a great deal of progress. I'm here today not only as a spokesperson of the Navajo government, but also as an individual Navajo who has walked across these sites, come to know these families, felt their anger, heard their stories of unexplained cancers, kidney failures, birth defects and sores that don't heal. This pitiful response to an obvious disaster must end. Please accept that the Navajo Nation

has proven that it is capable of being a true and equal partner with the United States in restoring the Navajo land and people to hozho (harmony). But we can't do it with our current woefully under funded budget and diminishing resources. We can't continue to have to beg the U.S. government for help only to be rejected and have to prove time and time again that we know our land better than the federal authorities.

We opened the borders of our land for uranium mining in an act of patriotism during the Cold War Era. Now we are left with a legacy of uranium contamination without substantial federal monetary help. Navajo patriotism and Navajo per capita contributions to American armed forces are now, and always have been unsurpassed. It's time for America to support the people who support America. We are a people who have a treaty with the government of the United States. The treaty of 1868 is sacred to my people. We have always honored our obligations under that treaty. The presence of unpermitted, unlawful hazardous waste dumps on our land amounts to a taking of our land in violation of this treaty. We now look to the government we have faithfully served to honor its obligations.

TESTIMONY OF PHIL HARRISON

Good morning honorable members of this Committee and honorable Chairman Waxman.

My name is Phil Harrison. I'm fifty years old, an enrolled member of the Navajo Nation, a veteran of the United States Armed Forces and an elected delegate to the Navajo Nation Council. I am not here today as an official representative of the Navajo government. I'm here as a private citizen, a proud citizen of the Navajo Nation, a proud citizen of the State of Arizona and a proud citizen of the United States of America.

I'm here to tell a story. In one sense it's my story. But, in a broader sense it's the story of my people. I'm also here to look forward, not backward, and to tell you what I think needs to be done to assist my people and my land in recovering from the devastation caused by short-sighted, and, in some cases, mean spirited people who put their own private interests first and ignored the fact that their choices and decisions would result in an inhumane experiment being conducted on an indigenous people.

I grew up in uranium mining camps. I drank uranium contaminated water from those mines. We washed our clothes in uranium contaminated water. I watched children going into the mines and playing on the waste piles. We made our coffee with the uranium contaminated water. In all likelihood I've continued to drink uranium contaminated water through the years.

There were two wells in Cove Arizona near where I live. Both tested positive for uranium and other radio nuclides. One of the wells was closed by IHS but with the other all they did was blend the water with water from another source and tell us the problem was solved. My father started working in the uranium mines in about 1950. I worked in

a uranium mine in the summer of 1969. I saw cisterns in the mines and watched miners drink three or four cups a day of water from the mine.

My little brother, Herman James Harrison, died of a stomach ailment at the age of six months. He drank the uranium contaminated water. Please realize when I tell you about uranium contaminated water we're not just talking about a situation that occurred thirty, forty or fifty years ago. We're talking about a situation that is occurring today in places like Tuba City, Arizona and other places throughout Navajo Indian Country. The experiment on our health and welfare, being conducted with the complicity of the United States government, continues. We are an indigenous people. We raise sheep and cattle. We drink water where we find it and the sad story is that there is, in all likelihood, plenty of uranium contaminated water to be found on our land. I know many people suffering from kidney problems and I wonder if they're drinking uranium contaminated water.

The Navajo people revere Mother Earth (land) as sacred within a highly spiritual context. So, when uranium mining occurs, it's considered ripping out the guts of Mother Earth. For the Navajo people, sacred sites are the foundation of all our beliefs and practices (communing with higher spiritual powers) because they represent the presence of the sacredness in our lives. It properly informs us that we are not greater than nature and that we have a responsibility to the rest of the natural world that transcends beyond our mere human desires. The more we destroy our planetary nest, we shall have to learn a bitter lesson in the future.

My father died of lung cancer in 1971 at the age of 46. My cousin's father, also a mine worker, died of lung cancer at the age of 42. All of my brothers and sisters have thyroid problems and disorders. They didn't work in the mines but they grew up in areas

contaminated by the mine wastes. I have scarring on my left lung. In 1999 my kidneys failed and I was on dialysis until 2001 when I received a kidney transplant from my sister. My story is not unusual. I only worked in the mines for a few months but I've lived in a uranium mine waste contaminated land all my life. This is the story of my people, a people whose patriotism and loyalty to the United States of America is unparalleled. Code Talkers are finally being recognized in the movies and the newspapers for the heroes that they were. Yet, I've known some of these very Code Talkers who have suffered and died from diseases caused by this continuing experiment on my people. When will this experiment end?

I don't know what will happen next to me. I suffer from a skin disorder that I've been told is connected with exposure to uranium contaminated substances. I don't know what, if anything, will happen as a result of the scarring on my lung. I consider myself to be very lucky to be here today and, in one sense, I consider myself to be in great shape for the shape I'm in.

Having said all this I believe that I lead my life looking forward, not backward. You have the power to change things. You have the power to end this tragic experiment. Here are some of the steps that you can take, starting today to bring life in what we call Diné Bikeyeah back into harmony, and harmony, or hozho, is perhaps the most central concept in our view of the world.

You can support the proposed amendments to RECA as set forth in an exhibit to be submitted with my testimony. You can remove illogical barriers to the provisions of compensation to former Navajo uranium workers and their families. For sixty five years since 1942, Navajo men, woman and children have been subjected to the catastrophic

effects of exposure to uranium mining milling, and the effects of downwind exposure to nuclear test sites. This has benefited the United States, but has been a tragedy to the Navajo Spirit. It is TOO late to help those like my father who have died from this devious exposure. Apologies are appreciated, however an apology is hollow without just compensation. Please change the laws to allow justice for the Navajo people. You can also support the measures set forth in the testimony of Resources Committee Chairman George Arthur.

It's been about twenty-five years since the last mines closed. My people shouldn't have to wait another twenty-five years for the federal government to accept a responsibility that it should have accepted many years ago.

Testimony before the Committee on Oversight and Government Reform

Congress of the United States

House of Representatives

October 23, 2007

By Doug Brugge, PhD, MS

Good morning/afternoon Chairman Waxman and members of the committee. My name is Doug Brugge, I have a PhD in cellular and developmental biology from Harvard University and an MS in industrial hygiene from the Harvard School of Public Health. I am currently associate professor in the department of public health and family medicine at Tufts University School of Medicine. I also direct the Tufts Community Research Center. I have over 20 academic publications about uranium and the Navajo people, including a 2006 book that I co-authored, entitled The Navajo People and Uranium Mining. I have studied the Navajo people in part because they are facing a crisis in uranium contamination.

Appearing before this congressional hearing today reminds me of the long history of such hearings, beginning in the 1960s and continuing through the 1970s, 80s and 90s, that sought and eventually achieved a semblance of compensation for Navajo and other uranium miners. I am deeply saddened by the fact that so little has been accomplished over those decades to eliminate the health hazards faced by the enormous quantities of uranium waste on the Navajo reservation. There has been too little research on the health impacts of uranium mining in Navajo communities. The one study underway, for example, will mostly address kidney disease and not birth defects or cancer. Today as we begin the public process of addressing community exposures, I can only hope that the path is far shorter than the one traveled by the uranium miners and their families.

I will now spend a few moments describing the hazards faced by the Navajos today. Clearly, uranium ore is a toxic brew of numerous nasty hazardous materials. Uranium, itself highly toxic, gives rise to a series of other radioactive decay elements that are found in raw, natural ore. Most significant among these are radium and thorium, both of which are highly radioactive. When radium decays it produces radon gas, a potent toxicant. Because it is a gas that becomes

airborne, when radon decays it transforms into a series of highly radioactive "radon daughters" that can lodge in the lungs.

The primary heavy metal toxicants in uranium ore include uranium itself and arsenic, as well as vanadium and manganese. During the first phase of processing uranium, most of the uranium is removed, leaving behind mill tailings which retain most of the other toxic contaminants from the ore. The milling of uranium is an industrial process that involves crushing and grinding of the rock and the addition of acids and organic solvents to facilitate concentration and removal of the uranium. Hence, uranium mill tailings and mill tailings effluent are not only highly radioactive, but they are acutely hazardous.

The health effects of uranium and its associated radioactive decay products and heavy metals that rise to the level of proven or near-proven causal links include:

1) Radon, which causes lung cancer and in fact, it is the primary source of lung cancer among Navajo uranium miners;
2) Uranium, which as a heavy metal causes damage to the kidneys and birth defects ;
3) Radium, which causes bone cancer, cancer of the nasal sinuses and mastoid air cells and leukemia; and
4) Arsenic, which causes lung and skin cancer, as well as neurotoxicity, hyperpigmentation and hyperkeratosis of the skin.

There are may also be many other negative health effects from exposure to uranium and its byproducts. In short, there is a clear causal link between uranium exposure and human health. The Navajos continually exposed to uranium and its byproducts even today face grave threats to their health.

I would like to conclude with some observations about the Navajo community of Church Rock, both historical and present day. Church Rock is located outside of Gallup, New Mexico, in the Navajo Nation. The Church Rock tailings spill remains the largest industrial release of radioactive wastes in the history of the United States. In 1979, only months after the Three Mile

Island release, a dam holding back a tailings lagoon maintained by United Nuclear Corporation failed, sending 94 million gallons of radioactive and acidic wastewater and 1,100 tons of toxic and radioactive mill waste into the Puerco River. This release, which was substantially larger than the release at TMI, flowed into a low-income, largely Native American community. This incident has been virtually ignored in the press and scientific literature.

For the people in Church Rock and other Navajo communities contaminated for decades with uranium ore tailings there are no "good" options, too much harm has already been done. But there are ways that we can gradually make things better so that maybe the children and the grandchildren of the Navajo uranium miners are not still grappling with this toxic legacy. A good start would be to provide sufficient resources to secure or remove contamination at these hazardous waste sites and to do so in a manner that prevents additional exposure to nearby residents. And Congress must fund the Navajo Nation and federal health agencies to provide resources for health studies among the tens of thousands of Navajo community members who still live next to abandoned mines and-or who were exposed to uranium from the contaminated dusts brought home by their working relatives.

I leave you to ponder a simple observation about this egregious situation: As terrible as the health effects that we know arise from toxins in uranium tailings, there are almost certainly additional ways that the health of Navajo people living near uranium mill and mine waste has been affected. If we are to understand the full extent of this injustice, we will also need additional health studies.

Draft Testimony of Edith Hood

"Where I'm from…"

There is no place like *Dinétah*, a place of the *Naabanis*. But if you are not from the Rez, you don't know the white dawn of morning, you don't know the clear blue sky, an autumn twilight and the twinkling stars of the night. Where I'm from, there are pinon-covered mesas, our beautiful and sacred mountains, sandy deserts. Where I'm from, in a placed called Red Water Pond Road, there is also yellowcake, uranium waste, and sickness. I live about 12 miles north of Church Rock on the Navajo Reservation, between two abandoned mine sites.

I grew up with cultural teachings of a loving grandfather, a medicine man, a traditional leader. He taught us to respect Mother Earth for she gives us all the necessities of life. There is a Navajo concept called *Hózh=*. *Hózh=* is how we live our lives - it means balance, beauty and harmony between we, the Five-Finger People, and nature. When this balance is disturbed, our way of life, our health, and our well being all suffer. The uranium contamination and mining waste at my home continues to disrupt *Hózh=*.

I think it was in the 1960s -- I was only a teenager when strangers arrived. I remember Grandmother running to stop them from making roads into the wooded areas. The stakes she drove into the ground did not keep them out. No one ever told her what was happening. The exploratory drilling people had arrived. There was no respect for people living there, and certainly no respect for Mother Earth.

Today, as I pray in the early morning dawn, there is a man-made mesa of radioactive and hazardous waste about a quarter of a mile northeast of my residence. In the other direction, to the south about one thousand feet away, is another mound of uranium mining waste. At least the one to the northeast has some dirt on top; the one to the south has been left uncovered since it was created in 1968 and since the company stopped mining twenty-five years ago.

From my front yard I can see these waste piles. This waste seems to be piled everywhere. There are mountains of it - fifty, sixth feet high. This is the tailings or muck of pulverized uranium ore -- I don't know what else is in them.

They told us it is "low grade", that most of the uranium has been extracted from it. This stuff is spread by wind and water. We breathe it and live with it every day.

Our community continues to live under these conditions. The mining companies have gone, but there is still equipment and tools, concrete blocks, pieces of protective clothing, brattice cloths, bolts, mesh wire, and vent bags sticking out of the Earth, scattered about.

My family and relatives live among these sites. Children still play in the fields and ditches, among the rocky mesas, in the arroyo that once carried contaminated mine water. The sheep still get through the fence that is supposed to barricade these uranium mine tailings. We eat these sheep.

These places are still contaminated. I know because I learned how to survey the ground for radiation when our community got involved in a monitoring program in my area four years ago. I know because the government people told us it was. I watched as the EPA people dug up the contaminated soils from around the homes of my sister and other relatives this May.

I worked at the Quivira, also known as the Kerr McGee mine, 2000 feet underground with a geology unit. I was diagnosed with lymphoma in the summer of 2006. My father has a pulmonary fibrosis. My mother was diagnosed with stomach cancer. My grandmother and grandfather died of lung cancer. Many of my family members and neighbors are sick, but we don't know what from.

Today, there is talk of opening new mines. How can they open new mines when we haven't even addressed the health impacts and environmental damage of the old mines? Mining has already contaminated the water, the plants, and the air. People are sick and dying all around us.

Waste is seeping into the ground and may have already reached the underground water supply. I think about the shaft and vent holes that brought out exhaust from underground, were they cemented and sealed? If so, was the work done properly? If not, could there be poisonous gases escaping from these vents? Is the shaft acting as a passage way to the groundwater?

We need your help to clean up the mess that the mining companies and the U.S. government have burdened us with. We need help to stop mining companies from coming in and making a

new mess. We need to restore *Hózh=* so that we may live in balance and harmony with each other and nature as Navajo people, as *Diné*.

Attachment 3

UNITED STATES COURT OF APPEALS
FOR THE TENTH CIRCUIT

NO. 07-9505

EASTERN NAVAJO DINE' AGAINST URANIUM MINING, et al.
Petitioners,

v.

U.S. NUCLEAR REGULATORY COMMISSION and
the UNITED STATES OF AMERICA,
Respondents.

Petition for Review of A Final Order of the U.S. Nuclear Regulatory Commission

UNCITED PRELIMINARY RESPONSE BRIEF FOR THE FEDERAL RESPONDENTS

Deferred Appendix Appeal, Oral Argument Requested

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STATEMENT OF RELATED CASES

This case has not been before *this* Court before. However, Petitioners filed four petitions for review of intermediate decisions by the Nuclear Regulatory Commission's Presiding Officer in the underlying proceeding in the District of Columbia Circuit. All four cases were styled:

Eastern Navajo Dine' Against Uranium Mining and Southwest Research and Information Center v. NRC,

No. 99-1190 (D.C. Cir.) (Challenging LBP-99-01, filed May 25, 1999);

No. 99-1194 (D.C. Cir.) (Challenging LBP-99-09, filed May 27, 1999);

No. 99-1195 (D.C. Cir.) (Challenging LBP-99-10, filed May 27, 1999); and

No. 99-1196 (D.C. Cir.) (Challenging LBP-99-13, filed May 27, 1999).

The District of Columbia Circuit dismissed all four petitions as premature in an unpublished opinion. *See* 1999 Westlaw 825552 (September 27, 1999).

Petitioners list the following cases as Related Cases because they address issues related to Hydro Resources' Project; however, the issues in these cases are not related to the issues in this case. Those cases are:

HRI, Inc. v. EPA, 198 F.3d 1224 (10th Cir. 2000);

HRI, Inc. v EPA, Case No. 07-9506 (10th Cir.) (currently pending).

The Federal Respondents are not aware of any other related cases.

GLOSSARY OF TERMS AND ACRONYMS

TEDE	--	Total Effective Dose Equivalent
DEIS	--	Draft Environmental Impact Statement
FEIS	--	Final Environmental Impact Statement
ISL	--	in situ leach
PO	--	Presiding Officer
LC	--	License Condition
NORM	--	Naturally Occurring Radioactive Material
TENORM	--	Technologically Enhanced Naturally Occurring Radioactive Material

JURISDICTION

Federal Respondents agree that Petitioners have properly invoked this Court's jurisdiction under the Hobbs Act, 28 U.S.C. § 2341, *et seq.*

ISSUES PRESENTED

1. Whether in licensing a uranium recovery project, the Nuclear Regulatory Commission ("NRC") acted reasonably under its regulations when it did not include background radiation from previous unlicensed operations in calculating the total effective dose equivalent ("TEDE") to the public from the licensed activity.

2. Whether NRC adequately identified and characterized radiation impacts under the National Environmental Policy Act ("NEPA").

3. Whether NRC reasonably based the initial surety for decommissioning on an initial estimate of the amount of water needed for groundwater restoration, when the surety can be adjusted later following demonstration projects required by the license.

4. Whether NRC reasonably allowed for changes to litigated restoration cost estimates when any such change would require a license amendment and a new opportunity for hearing.

5. Whether NRC adequately described the potential impacts of incomplete groundwater restoration under NEPA.

6. Whether claims by the *amicus* Navajo Nation not raised by Petitioners' opening brief are properly before this Court.

STATEMENT OF THE CASE

A. *Nature of the Case.*

In 1988, Hydro Resources, Inc. ("HRI") applied for a license to conduct *in situ* leach ("ISL") uranium recovery at its Church Rock site in New Mexico. Church Rock was later subdivided into two parcels, Section 8 and Section 17. HRI amended its application over the next four years, adding a proposed site near Crownpoint, New Mexico, and another site ("Unit 1") west of Crownpoint.

NRC published a notice of opportunity for hearing, and several interested individuals and organizations requested one. An NRC Presiding Officer ("PO") was appointed but delayed a decision on the hearing requests until NRC Staff had completed its technical review. In 1998, after completing review of the application, the Staff issued license SUA-1508, under 10 C.F.R. Part 40, authorizing HRI to conduct ISL recovery at all four sites. The PO then found that petitioners Eastern Navajo Diné Against Uranium Mining Southwest Research and Information Center, Grace Sam, and Marilyn Morris (collectively, "Petitioners") had demonstrated standing and identified sufficient areas of concern to be granted a hearing on HRI's license.

Because HRI planned to begin operations only at Church Rock Section 8, the PO bifurcated the proceeding, limiting "Phase I" to Section 8 issues and issues challenging the overall validity of the license. Based on the Phase I proceedings, the PO found no reason to revoke HRI's license either generally or specifically with respect to Section 8. After Phase II proceedings, a different PO found no reason to revoke HRI's license with respect to Section 17, Crownpoint, and Unit 1. The Commission ultimately upheld the findings approving the license, albeit in some cases after remand of certain issues. HRI has not yet started operations at any of the four sites.

This lawsuit challenges NRC decisions approving various aspects of the HRI license. It specifically challenges the measurement of dose to members of the public from radiological emissions at Section 17, litigated in Phase II, and NRC's approval of the groundwater restoration and financial assurance plan for Section 8, litigated in Phase I. The lawsuit also challenges aspects of NRC's compliance with NEPA regarding these two issues. Finally, the lawsuit argues that adoption of the financial assurance plan for the entire license violates Petitioners' hearing rights.

B. *In-Situ Leach Recovery.*

The Final Environmental Impact Statement ("FEIS")[1] for the HRI project contains a description of the ISL uranium recovery process. *See generally* FEIS at 2-2 – 2-12 (Joint App. at xxx -xxx).[2] The licensee injects a leach solution called "lixiviant" (a mixture of groundwater charged with oxygen and bicarbonate) through wells located in the zone containing uranium oxide ore ("ore zone"). The uranium oxide ore, which occurs as coatings on grains of sand within a sandstone rock host, dissolves when it comes into contact with the lixiviant and forms a uranium carbonate compound.

A licensee will operate production wells located inside a pattern of injection wells. Production wells create a reduced pressure in the ore zone by withdrawing slightly more water from the ground than is injected, causing the "pregnant" lixiviant (*i.e.*, the lixiviant that now contains dissolved uranium carbonate compound) to flow to the production wells where it is pumped to the surface. *See, e.g.*, Figure 2.1, FEIS at 2-3 (Joint App. at xxx).

At the surface, the licensee separates the uranium carbonate compound from the pregnant lixiviant. The now-barren lixiviant is re-charged as necessary with

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[1]NUREG-1508, Final Environmental Impact Statement (February 1997).

[2]"Joint App." refers to the Joint Appendix.

oxygen and bicarbonate, and is re-injected into the ore zone to repeat the cycle. The carbonate compound is processed to precipitate the uranium oxide, which is filtered and dried to produce uranium oxide concentrate, or "yellowcake," which is then shipped to other facilities for enrichment for reactor fuel.

The four HRI sites contain what are commonly known as "roll-front" uranium deposits. These fronts develop when uranium bearing groundwater flowing within an aquifer moves from areas with oxidizing chemical conditions to areas with reducing conditions. NUREG/CR-6733[3] at 2-1 (Joint App. at xxx). Dissolved uranium in the groundwater will precipitate out of solution when the groundwater encounters reducing conditions in the aquifer. This chemical reaction causes the uranium, and other "redox sensitive" elements such as selenium and vanadium, to precipitate out of the water onto the surface of sand grains in the aquifer. *Id.* Over long periods of time enough uranium precipitates out to form a "roll-front deposit, which take on a characteristic crescent shape." *See generally* FEIS at 3-12 – 3-13 (Joint App. at xxx-xxx).

Prior to recovery operations, the groundwater quality in the roll-front deposit will generally contain elevated concentrations of uranium and its decay products

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[3]NUREG/CR-6733, "A Baseline Risk-Informed Performance-Based Approach for In Situ Leach Uranium Extraction Licensees" (Center for Nuclear Waste Analyses) (Sept. 2001).

such as radium and radon, along with other parameters.[4] The elevated concentrations generally will not meet drinking water standards. Ford Affidavit (February 20, 1998)[5] at ¶40 (Joint App. at xxx). *See, e.g.*, NUREG/CR-6870[6] at 19-22 (Joint App. at xxx). However, because these parameters are generally confined to the ore zone, groundwater quality outside the roll-front deposit may be of good quality and not contain significant amounts of uranium and radium. Ford Affidavit (May 11, 1999) at ¶24.[7]

The most serious environmental impact associated with ISL recovery is the potential for groundwater contamination – specifically, elevated levels of trace metals in groundwater. NRC requires licensees to take "reasonable" steps to restore the groundwater to a pre-recovery "baseline" standard. NUREG-1569,

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[4]The FEIS uses the term "parameter" to refer to the various elements in the water. Petitioners use "contaminants" and other documents use "constituents." This brief will use "parameters" unless quoting a document or argument.

[5]Exhibit 9 to "NRC Staff Response to Motion for Stay, Request for Prior Hearing, and Request for Temporary Stay" (February 20, 1998).

[6]NUREG/CR-6870, "Consideration of Geochemical Issues in Groundwater Restoration at Uranium In-Situ Leach Mining Facilities" (U.S. Geological Survey) (January 2007).

[7]Exhibit 1 to "NRC Staff Response to Questions Posed in April 21 Order" (May 11, 1999).

NRC Standard Review Plan ("SRP")[8] at 6-9 (Joint App. at xxx). If the licensee cannot restore the water to pre-recovery baseline, its primary goal, it must restore the water to either EPA primary standards ("drinking water") or secondary standards of pre-operation "class use" which includes agricultural or livestock use. *Id.* If the licensee cannot "technically or economically" restore a particular parameter in the water to a secondary standard, the licensee must demonstrate that leaving the parameter at the higher level will not be a threat to public health and safety. *Id.*

The licensee establishes restoration baseline goals by taking groundwater samples after drilling the wellfield but before initiating the ISL process. FEIS at 4-15 (Joint App. at xxx). *See also* SRP at 2-24 (Joint App. at xxx); Ford Affidavit (January 22, 2001)[9] at ¶3 (Joint App. at xxx). The final design of the wellfield is not known until after the wellfield is constructed. SRP at 2-24. Each well provides the licensee with information used in determining the size and shape of the ore field and the relevant aquifer in order to complete the wellfield. *Id. See*

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[8]Standard Review Plan for In Situ Leach Uranium Extraction License Applications (June 2003).

[9]Exhibit 1 to NRC Staff Response to Intervenor's Financial Assurance Brief (filed January 22, 2001). *See also* Ford Affidavit (March 12, 1999), Exhibit 1 to "NRC Staff's Response to Intervenor's Amended Presentation on Groundwater Issues" (filed March 12, 1999), at ¶32 (Joint App. at xxx).

also Ford Affidavit (January 22, 2001), *supra*. In fact, an ISL operator cannot start drilling a wellfield and establishing baseline goals until after NRC issues a license. *See* 10 C.F.R. § 40.32(e). NRC requires licensees to average groundwater readings from across the ore zone to obtain a representative reading to establish a baseline for groundwater restoration. SRP at 5-30 – 5-41 (Joint App. at xxx-xxx). Licensees are required to take separate readings from "monitoring wells" outside the ore zone so that "excursions" of lixiviant outside the ore zone can be detected and controlled. *Id.*

After uranium recovery in a wellfield ends, groundwater restoration activities begin. Thus, restoration activities at an ISL site may be taking place at portions of the wellfield that have been mined while other wellfields are still engaged in mining activities or are being constructed. FEIS at 2-19 (Joint App. at xxx). Groundwater restoration is accomplished by injecting clean water to flush out the lixiviant and restore the groundwater to primary or secondary goals. *Id.* at 2-20 (Joint App. at xxx); NUREG/CR-6870 at 15 (Joint App. at xxx).

The amount of water used in this process is measured in terms of "pore volumes." SRP at 6-2 – 6-3 (Joint App. at xxx– xxx). A "pore volume" represents the water that fills the void space inside a certain volume of rock or sediment – a measure of the volume of water that must be pumped or processed to restore

groundwater quality. FEIS at 4-29 (Joint App. at xxx). The volume is calculated based on the porosity of the aquifer and estimated vertical and lateral extent of the aquifer. This volume of water is then used to calculate the amount of restoration surety. Ford Affidavit (January 22, 2001) at ¶¶ 5-7 (Joint App. at xxx). The cost of restoration is directly related to the amount of water needed to restore groundwater quality. FEIS at 4-29, *supra.*

NRC requires licensees to post a surety to cover estimated decommissioning costs. 10 C.F.R. Part 40, Appendix A, Criterion 9. NRC reviews the surety annually to check for depletion by inflation, increased costs, or changes in recovery operations, such as a change in the estimated amount of water needed to restore the groundwater. *Id.* These costs include flushing the wellfield and removing buildings and contaminated water. This review also ensures that new financial assurance estimates for sites not yet evaluated are maintained as current. Because the licensee will not know the exact size of the wellfield, or the precise baseline goals for water restoration until the wellfield has been drilled and testing completed, the initial surety amount is, by definition, an estimate. Ford Affidavit (January 22, 2001) at ¶17 (Joint App. at xxx).

C. *Statutory and Regulatory Background.*

1. *NRC's Source Material Regulations.*

NRC does not regulate conventional uranium mining. The Atomic Energy Act ("AEA"), 42 U.S.C. § 2011, *et. seq.*, requires an NRC license to transfer or receive in interstate commerce any "source material" (such as uranium ore) only "after removal from its place of deposit in nature." See CLI-06-14, 63 NRC 510, 512-13 (2006) (Joint App. at xxx-xxx), quoting 42 U.S.C. § 2092. NRC has traditionally viewed section 2092 as precluding jurisdiction over conventional uranium mining, which is governed by other regulatory authorities (normally states). *Id.* NRC regulates ISL recovery because it alters the chemical form of the uranium, the first step of processing. *Id.* Part 40 of NRC's regulations governs processing of uranium ore.

An ISL recovery license applicant must demonstrate that its equipment, facilities, and planned procedures will protect the public health and will not endanger life or property in the surrounding community. 10 C.F.R. § 40.32(c) and (d). In addition, applicants must establish a surety arrangement to assure sufficient funds will be available for decommissioning and decontamination of the site. 10 C.F.R. Part 40 Appendix A, Criterion 9. The amount of the surety arrangement must be based upon Commission-approved cost estimates. *Id.*

2. *NRC's Radiation Protection Regulations.*

NRC regulations in 10 C.F.R. Part 20 establish radiation protection standards for activities conducted under NRC licenses. *See* 10 C.F.R. § 20.1001. Section 20.1301 requires that the "TEDE"[10] to individual members of the public "from the licensed operation" – not including "background radiation" – not exceed 0.1 rem (1 mSv) in a year:

> (a) Each licensee shall conduct operations so that --
>
> (1) The total effective dose equivalent to individual members of the public from the licensed operation does not exceed 0.1 rem (1 mSv) in a year, exclusive of the dose contributions from background radiation, from any medical administration the individual has received, from exposure to individuals administered radioactive material and released under Sec. 35.75, from voluntary participation in medical research programs, and from the licensee's disposal of radioactive material into sanitary sewerage in accordance with Sec. 20.2003. . .

10 C.F.R. § 20.1301.

"Background radiation," excluded from TEDE calculation, is defined in Part 20:

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[10]TEDE is defined as the "sum of the deep-dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures)." 10 C.F.R. § 20.1003.

> Background radiation means radiation from cosmic sources; naturally occurring radioactive material, including radon (except as a decay product of source or special nuclear material); and global fallout as it exists in the environment from the testing of nuclear explosive devices or from past nuclear accidents such as Chernobyl that contribute to background radiation and are not under the control of the licensee. "Background radiation" does not include radiation from source, byproduct, or special nuclear materials regulated by the Commission.

10 C.F.R. § 20.1003.

3. *NEPA and NRC's NEPA Regulations.*

NEPA, 42 U.S.C. § 4321 *et seq.*, established a process to consider the environmental consequences of proposed major Federal actions. *Vermont Yankee Nuclear Power v. NRDC*, 435 U.S. 519, 558 (1978). That goal is "realized through . . . procedures that require that agencies take a 'hard look' at environmental consequences." *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989). NEPA imposes procedural, rather than substantive requirements. So long as the adverse environmental effects of the proposed action are adequately identified and evaluated, the agency is not constrained by NEPA from deciding that other values outweigh environmental costs." *Id.*

NRC regulations in 10 C.F.R. Parts 40 and 51 require an application to include an Environmental Report describing the environmental impacts of the

proposed action and alternatives. *See* 10 C.F.R. § 40.31(f); § 51.45(b); § 51.60(a). NRC then determines whether to publish a draft environmental impact statement ("DEIS") and FEIS, or issue an environmental assessment and finding of no significant impact. 10 C.F.R. §§ 51.20, 51.21.

Intervenors in NRC licensing proceedings may seek adjudicatory hearings on environmental issues. In NRC practice, "[t]he adjudicatory record and Board decision (and, of course, any Commission appellate decisions) become, in effect, part of the FEIS." *Louisiana Energy Services, L.P.* (Claiborne Enrichment Center), CLI-98-3, 47 NRC 77, 89 (1998).

4. *NRC's Hearing Regulations.*

NRC regulations permit anyone with an "interest" in a licensing proceeding to obtain a hearing. *See* 10 C.F.R. § 2.1205(a) (2003). This proceeding was governed by the informal hearing procedures of the former 10 C.F.R. Part 2, Subpart L.[11] Under those procedures, petitioners were to submit material "areas of concern" and a PO was appointed to rule on the hearing request and to conduct the hearing via written presentations. *See* 10 C.F.R. §§ 2.1205(e)(3); 2.1207 (2003). The PO appointed special assistants with technical expertise pursuant to 10 C.F.R.

[11]Subpart L was substantially revised in 2004. This proceeding was conducted under the pre-2004 rules.

§ 2.722 (2003). Rulings of the PO were appealable to the 5-member Commission. *See* 10 C.F.R. § 2.1253 (2003).

STATEMENT OF THE FACTS

A. *Radiological Emissions.*

One of the two Church Rock sites, Section 17, contains an abandoned conventional uranium mine intermittently operated by United Nuclear Corporation ("UNC") from the 1950s through 1982. Surface waste and debris from the UNC mine ("surface spoilage") are a source of radon gas emissions. ISL recovery operations can also cause radiological emissions in the form of radon and uranium particulates.

1. *LBP-06-01 – Initial Decision on Radiological Emissions.*

In Phase II of the adjudication, Petitioners challenged the license, alleging, *inter alia*, the radiological emissions from HRI's ISL mining operation at Section 17, combined with radiation from the UNC mine and its surface spoilage, would result in a Section 17 TEDE to the public exceeding 0.1 rem per year, in violation of 10 C.F.R. § 20.1301(a)(1). LBP-06-01, 63 NRC 41, 46 (2006). (Joint App. at xxx).

The PO ruled that undisputed record evidence showed the UNC mine had been sealed and was not a source of radiological emissions. *Id.* at 54-55. (Joint

App. at xxx). Citing 10 C.F.R. § 20.1301(a)(1), the PO then held that radiation from the surface spoilage should not be included in TEDE for two independent reasons: (1) it was already there and hence not from the "licensed operation," and (2) it emanates from source material not regulated by the Commission and is therefore "background radiation," which is excluded from TEDE. Upon excluding pre-existing radiation from the UNC mine and its surface spoilage, the PO found that TEDE for Section 17 is a small fraction of the regulatory limit. *Id.* at 70. (Joint App. at xxx). Therefore, he found that Petitioners' "emissions" challenge did not provide a basis for invalidating HRI's license for Section 17. *Id.* at 79 (Joint App. at xxx).

2. *CLI-06-14 – Commission Decision on Radiological Emissions.*

Petitioners appealed the PO's determination to the full Commission, which granted review. CLI-06-07, 63 NRC 165 (2006). (Joint App. at xxx). Upon review, the Commission agreed with the regulatory interpretation of the PO, affirming both of his reasons for excluding surface spoilage from TEDE. CLI-06-14, 63 NRC 510, 516-20 (2006) (Joint App. at xxx).

First, the Commission agreed that its regulations tie TEDE calculation to radiation from "licensed operation," and "both grammar and logic dictate that the emissions from already existing mining spoil do not constitute emissions from the

licensed operation." *Id.* at 516. (Joint App. at xxx). Because radiation emanating from this surface spoilage would not stem from HRI's newly-licensed ISL recovery operation, the Commission ruled that it should not be counted when calculating TEDE. *Id.*

The Commission also upheld the PO's second rationale – that radiation from the surface spoilage qualifies as "background radiation" under the definition in 10 C.F.R. § 20.1003 because it is a subset of "naturally occurring radioactive material," or NORM, and thus is explicitly excluded from the TEDE calculation by 10 C.F.R. § 20.1301(a)(1). *Id.* at 518. (Joint App. at xxx). The Commission rejected Petitioners' chief argument that the ordinary meaning of "naturally occurring" is "undisturbed in nature." *Id.* The Commission agreed with Petitioners that the phrase "naturally occurring" includes material "undisturbed in nature," but stated that the phrase can also be understood "to include [material] that has been moved, but neither artificially produced nor processed for its radioactive content." *Id.* at 519. (Joint App. at xxx).

B. *NEPA Review of Radiological Emissions.*

1. *LBP-06-19 – Initial Decision on NEPA Issues.*

In Phase II of the proceeding, Petitioners challenged the FEIS, claiming, *inter alia*, that it misrepresents radiation levels at Section 17 first by failing to

adequately take into account the previous uranium mining operations in the Church Rock area and second by characterizing the residual radiation from the previous mining operations as background radiation. *See* LBP-06-19, 64 NRC 53, 68 (2006). (Joint App. at xxx).

The PO found that "the FEIS expressly acknowledges that this region in general, and Church Rock in particular, has a history of conventional underground uranium mining that adversely affected the environment." *Id.* The PO noted that

> [a]lthough the FEIS recognizes that background radiation – including 'remnant radiation stemming from previous mining' operations (FEIS at 4-73) – is excluded from the TEDE calculation, it nevertheless discusses such radiation, estimating that individuals in Church Rock and Crownpoint receive about 225 mrem/year from background radiation.

Id. at 69. (Joint App. at xxx). Accordingly, the PO found that "[c]ontrary to the Intervenors' assertion . . . the NRC Staff did not ignore the existence of discrete sources of higher background radiation in Church Rock." *Id.* at 70. (Joint App. at xxx). In fact, he stated, "[w]hen the FEIS analyzed the cumulative radiological impact at Section 17, it took into account the background radiation – including the radiological remnants from the prior mining operations . . . ." *Id.* at 71 (Joint App. at xxx).

The PO also rejected Petitioners' assertion that the FEIS misrepresented the TEDE by characterizing radiation from the surface spoilage on Section 17 as background radiation. *Id.* at 72. (Joint App. at xxx). This argument, he held, was "foreclosed as a matter of law" by the Commission's decision in CLI-06-14 (discussed above), which addressed this same issue. *Id.*

2. *CLI-06-29 – Commission Decision on NEPA Issues.*

Petitioners sought Commission review of the PO's decision. CLI-06-29, 64 NRC 417, 423 (2006). (Joint App. at xxx). The Commission denied review, observing that "[i]ntervenors understandably . . . focus upon the adverse effects of former mining, but they have not explained why [an] additional, and expected to be negligible, radiation impact . . . would have any public health and safety significance." *Id.* (Joint App. at xxx).

C. *Groundwater Restoration and Surety.*

License Condition ("LC") 10.21A requires HRI to restore groundwater to baseline as a primary goal. *See* SUA-1508, LC-10.21A. (Joint App. at xxx). If groundwater quality levels cannot be returned to average pre-lixiviant injection levels, it requires a secondary goal of returning groundwater quality to maximum concentration limits as specified in U.S. Environmental Protection Agency ("EPA") primary and secondary drinking water regulations. *Id.*

HRI originally estimated that it would take 4 pore volumes of water to bring the groundwater in each of the proposed sites to restoration standards. *See, e.g.,* FEIS at 4-40 (Joint App. at xxx). NRC Staff found that insufficient and estimated that it would take 9 pore volumes of water to restore the groundwater at the proposed project sites. *Id.* Accordingly, the FEIS "calculated groundwater impacts [at each of the proposed sites, including all of Church Rock] assuming the use of 9 pore volumes for groundwater restoration." *Id. See also id.* at 4-58 to 4-60, 4-122. (Joint App. at xxx– xxx, xxx).

The Staff based its 9 pore volume initial estimate primarily on the results of a large-scale pilot project – termed the Section 9 Pilot Project – conducted by the Mobil Oil Company in 1979, approximately 1 mile north of the Unit 1 site. *See* FEIS at 4-33 – 4-34, 4-37 – 4-40 (Joint App. at xxx–xxx, xxx–xxx); Ford Affidavit (May 11, 1999) at ¶¶ 16-25 (Joint App. at xxx–xxx). NRC Staff considered the Mobil data to be the most reliable indicator of the number of pore volumes needed to restore groundwater quality at Section 8. *See* Ford Affidavit (January 22, 2001) at ¶¶9-10 (Joint App. at xxx).[12]

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[12]HRI submitted the results of some smaller tests, *e.g.*, FEIS at 4-31 (Joint App. at xxx), but NRC Staff relied primarily on the Mobil Section 9 test. Ford Affidavit (January 22, 2001), *supra.*

NRC Staff recognized that a large-scale, site-specific groundwater restoration demonstration would provide added confidence and emphasized that more site-specific information would be necessary to demonstrate that restoration standards could in fact be achieved at the HRI sites on a large, production-scale level. FEIS at 4-62, 4-113. (Joint App. at xxx, xxx). NRC Staff also believed it prudent to obtain this commercial-scale information before HRI proceeded with operations "beyond Church Rock" (which at the time of the Staff's review included both Sections 8 and 17). *See* Hearing Transcript ("TR") (Nov. 8, 2001) at 304, 307 (Joint App. at xxx, xxx).

Accordingly, LC-10.28 requires HRI to conduct a demonstration, "on a large enough scale, acceptable to the NRC," to determine the number of pore volumes required to restore a production-scale well field, which would include a number of production and injection wells. *Id.* (Joint App. at xxx); *see also* FEIS at 4-15 (Joint App. at xxx). LC-10.28 also bars HRI from injecting lixiviant beyond the Section 8 site – *e.g.*, at Section 17, Unit 1, or Crownpoint – unless NRC has approved the results of the Section 8 groundwater demonstration. The PO held that the "Section 8 production well field demonstration [will] give . . . the absolute best information" to make any necessary adjustments to the number of pore volumes required for

groundwater restoration at the other sites. *See* LBP-04-03, 59 NRC at 95. (Joint App. at xxx).

The license also specifies that surety for the restoration of HRI's initial well fields be based on the initial nine pore volume estimate and maintained at this level until the number of pore volumes required to restore the groundwater quality of a production-scale well field has been established by the restoration demonstration required by LC-10.28. *See* LC-9.5. (Joint App. at xxx). LC-9.5 stresses that if "at any time it is found that well field restoration requires greater pore volumes or higher restoration costs, the value of the surety will be adjusted upwards." *Id.*

Moreover, HRI committed to performing additional "concurrent" restoration demonstrations at each site.[13] FEIS at 4-39 (Joint App. at xxx); Transcript ("TR") at 287-305, 311-12, 319-20 (Joint App. at xxx–xxx, xxx–xxx, xxx-xxx). These smaller demonstrations are in addition to the large project required by LC-10.28. TR at 319-21 (Joint App. at xxx-xxx). While smaller than the restoration project required by LC-10.28, these demonstration projects will provide additional information for NRC to consider when reviewing HRI's surety. *Id.*

1. LBP-99-13 – Initial Decision on Financial Assurance.

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[13]This commitment is now a requirement under HRI's License because it is included in HRI's Consolidated Operating Plan, pg. 165-67 (Joint App. at xxx-xxx), expressed with a mandatory "will." *See* LC-9.3 (Joint App. at xxx).

In Phase I of the proceeding, Petitioners challenged the initial nine pore volume estimate as a standard for calculating surety requirements. The PO found that Petitioners "have not provided any analysis or expert testimony that casts doubt on the Staff estimate." LBP-99-13, 49 NRC 233, 236 (1999) (Joint App. at xxx). The PO noted that LC 9.5 allows that the "surety amount may be increased if 'at any time' it is determined that well-field restoration requires greater pore volumes or a higher cost." *Id.* at 236-37. (Joint App. at xxx). The PO acknowledged that HRI had failed to submit a decommissioning financial assurance plan, but interpreted the Commission's regulations not to require such a plan until just prior to project commencement. *Id.* at 236. (Joint App. at xxx).

2. *CLI-00-8 – Commission Decision on Financial Assurance.*

On appeal, the Commission affirmed LBP-99-13 with respect to pore volumes, concurring with the PO that Petitioners' expert had provided "unconvincing" testimony. CLI-00-8, 51 NRC 227, 244 (2000). (Joint App. at xxx). The Commission observed that the attempt of Petitioners' expert, Dr. Sheehan, "to establish the insufficiency of nine pore volumes [was] comprised of nothing more than a brief footnote alluding summarily to the fact that two other ISL projects required significantly more pore volumes." *Id.* Further, the Commission found Dr. Sheehan failed to "indicate why the two other ISL projects

were geologically analogous to the Crownpoint Uranium Project, nor [did] he address the pore volumes needed to restore the aquifers at any other ISL projects." *Id.* at 244-45. (Joint App. at xxx–xxx).

The Commission overturned the PO's holding that HRI was not required to submit a financial assurance plan until just prior to commencing operations. *Id.* at 240-41. (Joint App. at xxx–xxx). The Commission ruled that the financial assurance plan and cost estimates must be submitted prior to licensing. *Id.* Rather than revoking HRI's existing license, the Commission added a license condition prohibiting HRI from using its license until its financial assurance plan was approved by the NRC Staff. *Id.* at 241-42. (Joint App. at xxx).

D. *Phase I Groundwater Restoration.*

1. *LBP-99-30 – Initial Decision on Groundwater Restoration and NEPA.*

Petitioners also challenged the sufficiency of HRI's groundwater restoration plan for Section 8, again alleging that nine pore volumes was insufficient to restore the groundwater. *See* LBP-99-30, 50 NRC 77, 99-106 (1999). (Joint App. at xxx–xxx). Petitioners also alleged that the FEIS inadequately described the impacts of the project. *Id.* at 109 (Joint App. at xxx). The PO found that it was likely that nine pore volumes would restore the water quality as required by the license, *id.* at 103-07 (Joint App. at xxx–xxx), and that Petitioners had failed to state separate

NEPA grounds for their arguments, having relied instead on grounds previously addressed. *Id.* at 109 (Joint App. at xxx). Thus, he dismissed their NEPA claims. *Id.*

The PO based his groundwater findings partly on an affidavit of William H. Ford, an NRC geohydrologist, who stated that "it is extremely likely that . . . the groundwater quality will be restored to acceptable levels," and that "most, if not all, of the groundwater parameters will achieve the secondary groundwater restoration goals stated in HRI License Condition 10.21." *Id.* at 103. (Joint App. at xxx).[14] The PO recognized the uncertainty associated with Mr. Ford's "most, if not all" statement, but observed that only 6 of the 26 parameters at the Mobil demonstration failed to meet groundwater restoration goals. Three (calcium, sodium, and molybdenum) are "not considered hazardous to humans." *Id.* The PO found that arsenic, a hazardous parameter not fully restored at the Mobil site, was much more concentrated at the Mobil site than at Section 8, but nevertheless came very close (0.079 mg/L) to the primary standard of 0.05 mg/L. *Id.* at 104. (Joint App. at xxx). For these reasons, the PO found that arsenic restoration would not present a problem at Section 8. *Id.*

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[14]Mr. Ford's experience and credentials are provided in his February, 1998 Affidavit. *See* Joint App. at xxx-xxx, xxx-xxx.

The two remaining parameters are radium and uranium. *Id.* After weighing the evidence presented, the PO found that failure to meet the primary or secondary groundwater standards for these parameters would not endanger public health and safety at Section 8. *Id.* The PO found no evidence of water with elevated uranium levels away from Section 8, despite the fact that initial measurements indicate the site has uranium levels far above drinking water standards. *Id.* He took this as "persuasive evidence that uranium does not travel readily though the aquifer, even over time scales of thousands of years." *Id.* He made a similar finding for radium contamination, noting that "water in the vicinity of a uranium deposit may be well above safe standards for radium in the vicinity of the mining area, as at Church Rock, but the water from the same aquifer will be safe to drink away from the mine area because the toxic elements are diluted and precipitated." *Id.* at 105. (Joint App. at xxx).

2. *Commission Review of LBP-99-30.*

The Commission declined review of the PO's groundwater decision in LBP-99-30, stating that Petitioners had not identified any "clearly erroneous" factual finding or important legal error. CLI-00-12, 52 NRC 1, 3 (2000). (Joint App. at xxx).

In a separate decision, the Commission rejected Petitioners' NEPA claims arising out of LBP-99-30. CLI-01-04, 53 NRC 31, 45 (2001). (Joint App. at xxx). The Commission found that Petitioners' claim that the FEIS underestimates impacts to groundwater, was contradicted by "specific, technical, health and safety issues resolved in HRI's favor by earlier" PO and Commission decisions. *Id.* (Joint App. at xxx).

3. *LBP-04-3 – Initial Ruling on Restoration Action Plan.*

HRI submitted a Restoration Action Plan, including a financial assurance plan with cost estimates, in response to the Commission's holding in CLI-00-8. *See* LBP-04-3, 59 NRC at 87-88 (Joint App. at xxx-xxx). Petitioners challenged several aspects of HRI's Plan, including estimated groundwater restoration costs. *Id.* at 88. (Joint App. at xxx). The PO approved the Plan, after requiring certain corrections; however, the PO refused to consider Petitioners's challenges to the Staff's pore volume estimate "[b]ecause this issue has been affirmed by the Commission." LBP-04-3, 59 NRC at 92-93. (Joint App. at xxx–xxx).

4. *CLI-04-33 – Commission Decision on Restoration Action Plan.*

On appeal, the Commission affirmed the decision. CLI-04-33, 60 NRC 581 (2004) (Joint App. at xxx). The Commission noted that "the reasonableness of the initial 9 pore volume estimate for groundwater restoration at Section 8 [had been] litigated, indeed litigated twice, in separate decisions on groundwater impacts and financial assurance." 60 NRC at 587. (Joint App. at xxx). The Commission explained that "[i]f the demonstration results confirm the [9 pore volume] estimate, no revision to the pore volume estimate will be necessary." On the other hand, "if HRI is unable to successfully complete the restoration demonstration using up to 9 pore volumes, it can't use that same number [as the estimate] for the remaining sites." *Id.* at 593. (Joint App. at xxx). Further, the Commission found that its proceedings, "though complex," had "not deprived the Intervenors of a meaningful opportunity to challenge the financial assurance plan," because they "had a fair opportunity to challenge the 9 pore volume estimate for Section 8." *Id.* at 593. (Joint App. at xxx).

The Commission stated that "[t]he fact that data from the restoration demonstration project will be reviewed for confirmation of the 9 pore volume estimate," did not "obviate the fact that a meaningful hearing has been provided for the adjudication of the 9 pore volume estimate." *Id.* The Commission also noted

that "HRI is required to update and the NRC is to review the surety annually," and that, if these reviews find "that well field restoration requires greater pore-volumes or higher restoration costs, the value of the surety will be adjusted upwards." *Id.* & n 52. (Joint App. at xxx). Finally, the Commission noted that Petitioners will have hearing rights in any amendment to the License Conditions on surety and groundwater restoration resulting from the review of the restoration demonstration project. *Id.* at n 52.

SUMMARY OF ARGUMENT

1. NRC regulations explicitly provide that TEDE for a particular activity covers radiation dose "from the licensed operation" only. 10 C.F.R. § 20.1301(a)(1). Thus, radiation from waste from previous conventional mining at the HRI site is not included in TEDE for the Section 17 project. While this was not the original regulatory approach, it has been true ever since the NRC revised its radiation protection regulations (Part 20) in 1991. Contrary to Petitioners' arguments, statements in the 1991 rulemaking merely clarified that atmospheric fallout from weapons testing would not be included in TEDE, not that "all sources" of radiation under the licensee's control would be included.

Moreover, the requirement that TEDE include only doses from the "licensed operation" does not render unnecessary the specific exclusions in section 20.1301

for medical and sewer radiation. Those exclusions preserve the integrity of specific regulatory programs; they are necessary to clarify that Part 20's general radiation protection program does not apply to those programs.

Furthermore, the Commission reasonably found that existing radiation from the mine waste was "background radiation" under the Commission's regulations and thus expressly excluded from TEDE under Section 20.1301(a)(1). The mine waste material constitutes a subset of "naturally occurring radioactive material." While it is not in its original location, it has not been "artificially produced or processed" for its radioactive material and thus qualifies as background radiation under NRC's regulations. This Court should defer to the Commission's interpretation of its own regulations.

HRI's license does not adversely impact the public health and safety. HRI's licensed activity does not add a significant risk to the public health and safety. Mine waste will continue to be present at the site, regardless of whether HRI conducts operations, and radiation from HRI's activities will add only an insignificant amount to the current level of radiation.

2. NRC's FEIS acknowledged the presence of waste (surface spoil) from previous mining activities and described its extent and potential impact. Petitioners say that the FEIS overlooks the "cumulative impact" of the new

operations combined with the existing mine waste. But the FEIS – and the PO at an NRC hearing – considered that very issue and found the impact minimal. Petitioners give no sound reason for overturning NRC's record-based finding.

3. NRC reasonably established an initial surety for HRI's license based on an estimate that nine pore volumes of water would be adequate for restoration of groundwater within the ore zone after completion of ISL operations. This estimate was based on the best evidence available, the Mobil Section 9 test, in which 9-10 pore volumes of water restored all but 6 parameters to either primary or secondary restoration goals. Moreover, NRC conditioned HRI's license so that HRI must complete a full-scale restoration project in Section 8 before proceeding to Section 17, Crownpoint, or Unit 1. In addition, HRI has committed to concurrent small-scale demonstration projects at each licensed site. If NRC obtains information from either of these demonstrations that indicate additional pore volumes will be needed, NRC will issue new license conditions amending the license. In addition, NRC reviews the surety annually, and if these reviews show a need for additional funds, NRC will again amend the license. These considerations, and additional information in the record, provide ample support for the PO's (and the Commission's) decision to base HRI's initial surety on the nine pore volume estimate.

4. Under the AEA, amending an NRC license triggers a hearing opportunity. Here, any changes in the surety requirement caused by adjustments in NRC's pore volume estimate will require a license amendment. Thus, Petitioners' hearing rights have not been "subverted" by establishing a surety now, based on NRC's best estimate, subject to amendment later. Petitioners are also free to seek an increase in the surety under NRC's citizens' petition procedure, 10 C.F.R. § 2.206.

5. Contrary to Petitioners' claims, NRC's FEIS adequately described the potential impacts of inadequate groundwater restoration. The FEIS discloses the potential significant adverse effects that might result if groundwater quality is not restored and describes mitigative measures planned by HRI. The PO and the Commission correctly rejected Petitioners' NEPA claims in the administrative hearing because those claims, at bottom, rested on no more than Petitioners' already-rejected AEA claims.

6. The Navajo Nation has filed an *amicus* brief claiming that NRC did not "consult" properly with the Navajo Nation during the licensing process. However, that claim was not raised by Petitioners, either in the administrative hearing or in their brief to this Court; thus, that claim is not properly before this Court. In any event, the record shows that NRC consulted extensively with the Nation during the licensing process. The Navajo Nation's other claims are insubstantial.

STANDARD OF REVIEW

Judicial review rests on the administrative record and the agency's reasoning. Review is governed by the "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law" standard of the Administrative Procedure Act. *See* 5 U.S.C. §706(2)(A). This standard is "narrow and a court is not to substitute its judgment for that of the agency." *Motor Vehicle Mfs. Ass'n v. State Farm Mut. Auto. Ins.*, 463 U.S. 29, 43 (1983). A reviewing court must consider whether "the [agency's] decision was based on a consideration of the relevant factors and whether there has been a clear error of judgment." *Citizens to Preserve Overton Park, Inc. v. Volpe,* 401 U.S. 402, 416, (1971).

Agency decisions are "entitled to a presumption of regularity." *See Overton Park*, 401 U.S. at 415. A reviewing court must generally be at its most deferential where the challenged decision involves technical or scientific matters within the agency's area of special expertise. *Utah Envtl. Cong. v. Bosworth*, 443 F.3d 732, 740 (10th Cir. 2006). In cases where "specialists express conflicting views, an agency must have discretion to rely on the reasonable opinions of its own qualified experts even if, as an original matter, a court might find contrary views more persuasive." *Marsh v. Or. Natural Res. Council*, 490 U.S. 360, 378 (1989).

To the extent that the case involves a challenge to the NRC's interpretation of its own regulations, a reviewing court's "ultimate criterion is the administrative interpretation, which becomes of controlling weight unless it is plainly erroneous or inconsistent with the regulation." *Bowles v. Seminole Rock & Sand Co.*, 325 U.S. 410, 414 (1945); *see also Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 359 (1989); *Bar MK Ranches v. Yuetter,* 994 F.2d 735, 738 (10th Cir. 1993); *Valley Camp of Utah, Inc. v. Babbitt*, 24 F.3d 1263, 1267 (10th Cir. 1994).

NEPA requires an agency to take a "hard look" at the potential impact of its proposed actions. *Baltimore Gas & Elec. Co. v. NRDC*, 462 U.S. 87, 97 (1983); *Ecology Ctr., Inc. v. U.S. Forest Serv.*, 451 F.3d 1183, 1189 (10th Cir. 2006). This Court "appl[ies] a rule of reason standard (essentially an abuse of discretion standard) in deciding whether claimed deficiencies in a FEIS are merely flyspecks, or are significant enough to defeat the goals of informed decisionmaking and informed public comment." *Utahns v. United States DOT*, 305 F.3d 1152, 1163 (10th Cir. 2002).

ARGUMENT

I. NRC'S INTERPRETATION OF TEDE FOLLOWS THE PLAIN LANGUAGE OF THE AGENCY REGULATION AND IS CONSISTENT WITH PRIOR AGENCY INTERPRETATION.

A. *The TEDE Calculation is Limited to Dose "From the Licensed Operation."*

1. NRC regulations expressly limit TEDE calculation to dose "from the licensed operation." 10 C.F.R. § 20.1301(a)(1). Section 17 contains radioactive surface spoilage that predates, and is therefore not associated with HRI's "licensed operation." Accordingly, both the PO and the Commission held that this material was properly excluded from HRI's TEDE calculation. Petitioners, however, argue that NRC has historically interpreted the AEA in broader fashion and that section 20.1301(a)(1) has traditionally included the dose arising from any radioactive material "under the licensee's control." Petitioners' Brief ("Pet.Br.") 34-38. This argument is unsupported by any authority and is contradicted by the regulation's plain language.

Petitioners correctly point out that the *original* Part 20, promulgated in 1957 by NRC's predecessor, the Atomic Energy Commission, applied to both licensed and unlicensed sources within the possession of the licensee. *See* 22 Fed. Reg. 548, 549 (Jan. 29, 1957). Petitioners also note that NRC amended Part 20 in 1979,

amending the text of its "purpose" section to indicate that Part 20 applies to licensed and unlicensed activities regardless of who possessed the source. *See* 44 Fed. Reg. 32,349-32,351 (June 6, 1979).

But in 1991 the Commission changed Part 20. The new Part 20 not only lowered the dose limit to 0.1 rem, but also *reduced* the scope of the regulation (redesignated as 10 C.F.R. § 20.1301). *See* 56 Fed. Reg. 23,360, 23,398 (May 21, 1991). The regulation no longer applied to dose from "all known sources and operations, licensed and unlicensed," but only to dose "from the licensed operation."[15] *See* 56 Fed. Reg. at 23,398. This change in the governing regulatory language defeats Petitioners' claim that the TEDE calculation requires including all radiation sources on HRI's property.

2. Petitioners point to a statement in the 1991 Final Rule to argue that the scope of dose included in the TEDE calculation includes dose from any material within the licensee's control. Pet.Br. 37-38. In response to a public comment that the dose limit "should not include fallout from nuclear weapons tests . . . or other sources of radiation not under the control of the licensee," the Commission stated

[15]This was consistent with the purpose of Part 20, which is to protect "against ionizing radiation resulting from activities conducted under licenses issued by the [NRC]." 10 C.F.R. § 20.1001(a).

that the "new lower dose limit . . . applies only to doses from radiation and radioactive materials under the licensee's control." 56 Fed. Reg. at 23,374.

The Commission explained that this response was supported by the replacement of the 1986 proposed rule's exclusion of "natural background exposure" with the 1991 exclusion of "background radiation," a broader concept that included fallout, which is not under the licensee's control.[16] *Id.* at 23,374-75. This, the Commission stated, "clarifie[d] sources of radiation that can be excluded from evaluations of the *dose from licensed activities*." *Id.* (emphasis added). Thus, the "under the licensee's control" statement, in context, merely clarified – in response to a comment – that fallout would not be included in TEDE; it did not indicate that *all* materials under the licensee's control are to be included in TEDE. Instead, as the PO and the Commission ruled, section 20.1301(a)(1) on its face is limited to dose "from the licensed operation." LBP-06-1, 63 NRC at 66. (Joint App. at xxx); CLI-06-14, 63 NRC at 516. (Joint App. at xxx). In short, the Commission found it was *necessary* for the source to be under the licensee's control to be considered part of TEDE; the Commission did not find that it was *sufficient* – as Petitioners would have it.

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[16]In the 1991 amendment, background radiation was not yet specifically excluded from 10 C.F.R. § 20.1301(a)(1), but it was excluded from the scope of Part 20 by sections 20.1001(b) and 20.1002. *See* 56 Fed. Reg. at 23,391.

B. *NRC's Interpretation of Section 20.1301(a)(1)Does Not Render Its Specific Exclusions Unnecessary.*

Petitioners argue that the Commission's decision that the TEDE calculation under section 20.1301(a)(1) includes only dose "from the licensed operation" purportedly renders "unnecessary" the regulation's specific exclusions, in particular the exclusion of doses from medical administrations and doses from disposal in sanitary sewers. Pet.Br. 33-34.[17]

Petitioners' argument fails to consider that, in addition to the general dose limits established by section 20.1301(a)(1), NRC also maintains special regulatory regimes covering disposal of radioactive materials in sanitary sewers and covering medical administration of radiopharmaceuticals. *See* 10 C.F.R. § 20.2003 (sanitary sewers); 10 C.F.R. § 35.1 *et seq.* (medical administrations). Thus, section 2.1301(a)(1)'s "sewers" and "medical" exclusions are not mere surplusage. They recognize independent regulatory regimes for sewers and medical administrations and "clarify" that those special regimes, not Part 20's general dose limits, cover those particular activities. *See, e.g.,* 62 Fed. Reg. 4,120, 4,129 (1997); 60 Fed.

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[17]Petitioners erroneously assert that the Commission implicitly conceded this argument. Pet.Br. 33. But the Commission merely acknowledged a concern the PO raised. 63 NRC at 516 (Joint App. at xxx). The Commission obviously was not convinced by this argument, as it expressly ruled that TEDE calculation was limited to dose "from the licensed operation." *Id.*

Reg. 48623, 48624 (1995). *See also* 10 C.F.R. § 20.1002. The exclusions make plain that such licensees need not consider the excluded sources of radiation as part of their TEDE calculation, because those sources are independently regulated.

C. *Radiation from Surface Mining Spoil is "Background Radiation."*

Even if section 20.1301(a)(1)'s "licensed operation" clause did not defeat Petitioners' TEDE claim, the "background radiation" clause would – as both the PO and the Commission held. Under 10 C.F.R. § 20.1301(a)(1), background radiation is expressly *excluded* from the TEDE calculation. The PO ruled that the surface spoilage on Section 17 meets the regulatory definition of "background radiation" in 10 C.F.R. § 20.1003, because it is "TENORM," a subset of naturally occurring radiation or "NORM," which is background material not regulated by NRC. LBP-06-1, 63 NRC at 65-69 (Joint App. at xxx-xxx).[18]

1. The PO concluded that the surface spoilage is TENORM because it is "material containing radionuclides that are present naturally in rocks . . . and that have become concentrated and/or exposed to the accessible environment as a result of [conventional] mining operations." *Id.* at 67-68 (Joint App. at xxx-xxx). As the Commission stated in upholding this ruling, "over the years, the NRC and other

[18]The acronyms stand for Naturally Occurring Radioactive Materials and Technologically Enhanced Naturally Occurring Radioactive Materials.

regulatory authorities have repeatedly considered 'TENORM' as equivalent to 'NORM.'" CLI-06-14, 63 NRC at 518 (Joint App. at xxx). This provides a second, independent basis for excluding the radiation emanating from the surface spoilage from TEDE calculation. *Id.* at 520 (Joint App. at xxx).

2. Petitioners challenge the PO and Commission's ruling on background radiation. They contend that "naturally occurring" must be given its ordinary meaning, which they insist means "undisturbed in nature." Pet.Br. 39-40. They argue that the surface spoilage was disturbed when it was moved from below ground to the surface and cannot be considered "naturally occurring." Thus, they maintain, it cannot be considered NORM. *Id.*

As the Commission held, however, while the phrase "naturally occurring" certainly includes material "undisturbed in nature," it can also be understood "to include [NORM] that has been moved, but neither artificially produced nor processed for its radioactive content." CLI-06-14, 63 NRC at 519 (Joint App. at xxx). This is a situation where "a layman's reading of a regulation, uninformed by context," is not decisive. *Id.* (citation omitted). Instead, "technical terms of art should be interpreted by reference to the trade or industry to which they apply." *Id.* at 518-19 and n.46 (citing cases) (Joint App. at xxx-xxx). As the Commission

noted, this is "particularly true where, as here, that is the relevant regulatory agency's . . . understanding as well as that of the regulated industry." *Id.*

3. Petitioners allege that the Commission has changed its interpretation of the definition of "background radiation" since promulgating section 20.1301(a)(1) in 1991. Specifically, Petitioners argue that "at that time, TENORM was *not* commonly understood to be a subset of [NORM]." Pet.Br. 41 (emphasis in original). To support this argument, Petitioners note that the PO stated that it was not until 1998, seven years after the final rule, that the TENORM concept became common usage. *Id.* at 43.

The PO based this statement on an EPA report to Congress on TENORM. *See* LBP-06-01, 63 NRC at 67 (citing EPA 402-R-00-01, "Evaluation of EPA's Guidelines for [TENORM]," at 3, n.1 (June 2000)) (Joint App. at xxx). This EPA report stated:

> Before 1998, the term used for these materials was "Naturally Occurring Radioactive Materials" ('NORM'). Based on more current industry and regulatory practice, the term "TENORM" now is considered more appropriate.

EPA 402-R-00-01 at 3, n.1.

But the EPA report says only that TENORM did not gain independent significance, or come into common usage, until 1998. Before that time it was

known simply as NORM. Instead of undercutting the Commission's interpretation, Petitioners' cited EPA report actually shows that in 1991 the material known as TENORM was subsumed within the NORM. The fact that the material that later became known as TENORM was, in 1991, still considered NORM, indicates that the Commission did not distinguish between NORM and TENORM in 1991. If the Commission had intended to exclude this material from "background radiation," it presumably would have done so explicitly. The NORM's concept later subdivision, and the coining of the term TENORM, do not alter the original broad meaning of "background radiation."

4. Petitioners argue that the Commission's interpretation is contradicted by the language of NRC's 1986 proposed Part 20 changes, which defined "natural background radiation" as "cosmic and terrestrial sources of naturally occurring radioactive material, including technologically enhanced radioactive material, such as plasterboard and fertilizer . . ." Pet.Br. 41 (citing 51 Fed. Reg. at 1,126). Petitioners argue that the Commission's rejection of the phrase "technologically enhanced radioactive material, such as plasterboard or fertilizer," in the 1991 final rule, indicates that TENORM was not commonly understood to be a subset of NORM. Pet.Br. 41. Petitioners claim that a letter from the Chairman of the

Advisory Committee on Reactor Safeguards regarding the proposed rule supports their argument. *Id.* at 41-42.

But this episode actually supports the Commission's interpretation of "background radiation," not Petitioners'. The cited ACRS letter suggested that TENORM *not* be included in NORM. But the Commission considered and rejected that suggestion, adopting the recommendation of the NRC Staff instead. *See* CLI-06-14, 63 NRC at 518 (Joint App. at xxx) (citing SECY 88-315, Encl. 10, at 3-4 (Nov. 4, 1988)).[19] Thus, the Commission implicitly – if not explicitly – included TENORM within NORM in the 1991 final rule.

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The Commission's interpretation of background radiation to include TENORM is consistent with the plain language of the regulation, its regulatory history, and with the Commission's historical interpretation. This Court should give the Commission's interpretation "controlling weight." *Bowles v. Seminole Rock & Sand Co.*, 325 U.S. at 414; *Valley Camp of Utah, Inc. v. Babbitt*, 24 F.3d at 1267.

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[19]In the memo cited in the Commission's decision, NRC Staff argued that TENORM "should remain excluded" from the dose limits. SECY 88-315, Encl. 10, at 4 (Joint App. at xxx)

D. HRI's License Is Not Inimical To Public Health and Safety.

Petitioners assert, correctly, that NRC may not issue a source material license if such a license "would be inimical to the common defense and security or the health and safety of the public." Pet.Br. 31-32 (citing 42 U.S.C. § 2099). But it does not follow, as Petitioners seemingly would have it, that the Commission violated this principle when it licensed ISL operations, in themselves compliant with NRC regulations, in an area with relatively high pre-existing levels of background radiation from natural causes and mine wastes not subject to NRC regulation. On the contrary, it can be sensible policy to conduct new industrial operations where possible in places already somewhat degraded rather than in fresh new areas.

The situation would be different, of course, if licensing new impacts would somehow "tip the balance," for example, changing the surrounding areas from habitable to uninhabitable. But the Commission has authority – and would exercise it – to prevent such an outcome. *See* 10 C.F.R. § 20.1301(f).

Here, there is no evidence whatsoever that the TEDE of 0.1 rem or less allowed by HRI's license could have such an effect or would in any other way be inimical to public health and safety. On the contrary, the record contains an express finding that the HRI license "will make only a minor, insignificant addition

to overall preexisting radiological impacts" and poses "no significant threat to public health and safety." LBP-06-01, 63 NRC at 60 (Joint App. at xxx); *see also* FEIS at 4-24, 4-125 (Joint App. at xxx, xxx).

II. NRC'S FEIS ADEQUATELY IDENTIFIED AND CHARACTERIZED EMISSION IMPACTS FOR SECTION 17 PURSUANT TO NEPA.

A. *NRC Adequately Considered Cumulative Impacts.*

Petitioners (Pet.Br. 55) claim that the Commission violated NEPA by focusing on the incremental impacts of HRI's operations at Section 17, *i.e.*, the impacts from the licensed operation only, and ignoring the "cumulative impacts," *i.e.*, any synergistic, added impacts of ISL recovery given already-existing impacts from previous conventional mining at the same site. *See generally* 40 C.F.R. § 1508.7. Petitioners' challenge lacks substance. The FEIS and NRC's adjudicatory decisions provide a full analysis satisfying NEPA's "hard look" requirement and adequately informing both decisionmakers and the public of the cumulative impacts of past conventional and future ISL uranium mining at Section 17.

While the FEIS describes the background radiation – including the radiation resulting from previous mining operations – as being excluded from the TEDE calculation, NRC nonetheless took account of the combined effect of past and

future operations. *See* FEIS at 4-73 (Joint App. at xxx) ("Radiological effects during project construction would include natural background plus remnant radiation stemming from previous mining and milling activities"); DEIS at 3-19, 4-13[20] (Joint App. at xxx-xxx, xxx).

The PO explicitly considered – and rejected – Petitioners' cumulative impacts argument, explaining that "the FEIS expressly acknowledges that this region in general, and Church Rock in particular, has a history of conventional underground mining that adversely affected the environment." LBP-06-19, 64 NRC at 68 (Joint App. at xxx). Further, the PO also pointed out that the DEIS addressed "discrete sources of higher background radiation in Church Rock." *Id.* at 70. These sources include "elevated background radiation near the old mine road and State Route 566," which the PO found to be consistent with past use of the road, which was probably contaminated when a previous operator (UNC) hauled ore from its Section 17 mine to its mill. *Id.*

The PO concluded that the local background radiation level, including the radiological remnants from the prior mining operations, as described in the FEIS, is close to 225 mrem/year. *Id.* at 69 (citing FEIS at 4-72 (Joint App. at xxx)), 71. This, he noted, falls below the national average dose of background radiation

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[20]NUREG-1508, Draft Environmental Impact Statement (May 1994).

received by an individual, 300 mrem/year. *Id.* at 70 n.13 (citing LBP-06-1, 63 NRC at 60 n.16). The PO also found that HRI's operations would result in a dose to an individual member of the public "only slightly higher (well below a 1 percent increase)" than this background level. *Id.* at 71.

In sum, as the PO noted, "the FEIS analyzed the cumulative radiological impact at Section 17, it took into account the background radiation – including the radiological remnants from the prior mining operations," which the PO noted was within the typical range of background doses and found that "the increase in cumulative impacts resulting from HRI's operations will be *de minimis*." *Id.* at 71. Thus, as the PO made clear, "consistent with 42 U.S.C. § 4332(2)(C), the FEIS provides a 'detailed statement' about the history and impact of past uranium mining." *Id.* at 72.

In denying review of the PO's decision, the Commission stated: "Intervenors understandably . . . focus upon the adverse effects of former mining, but they have not explained why [an] additional, and expected to be negligible, radiation impact . . . would have any public health and safety significance." CLI-06-29, 64 NRC at 423 (citing CLI-01-4, 53 NRC 31, 69 (2001)) (Joint App. at xxx). As demonstrated above, the NRC explained that HRI's proposed operations when added to the impacts of the historic mining would have a *de minimis* impact.

In sum, it decidedly is *not* the case that NRC has licensed the ISL mining operation at Section 17 without adequate consideration of the cumulative impacts of past mining operations at the site. This record-based finding satisfies NEPA's "hard look" requirement. See *Utahns v. United States DOT*, 305 F.3d at 1163.

B. *The Commission Properly Characterized Radiation from Previous Mining Activity as Background.*

As discussed above, *see* page 38, *supra*, the radiological emissions emanating from the surface spoilage from previous mining activity on Section 17 are properly considered "background radiation" pursuant to the regulatory definition in 10 C.F.R. § 20.1003. Petitioners argue that by characterizing this radiation as background, NRC, contrary to NEPA, "confus[ed] the human-caused environmental impacts . . . with natural conditions that must be accepted as a part of the environment." Pet.Br. 58. This is incorrect.

As we have already shown, NRC's definition of "background radiation" is a technical one. It includes not just naturally-occurring radiation, but also various radiation sources attributable to human activity, such as "global fallout . . . from the testing of nuclear explosive devices or from past nuclear accidents such as Chernobyl."[21] 10 C.F.R. § 20.1003. Characterizing radiation as background in no

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[21]The term "natural background," which appeared in the 1986 proposed amendment to Part 20, was replaced by "background radiation" in the 1991 final

way labels it natural, nor is it an attempt to hide the human contribution to this source of radiation. The FEIS fully complied with NEPA by acknowledging and accounting for the impact of conventional mining at Section 17. NEPA requires no more.

III. NRC ESTABLISHED A REASONABLE INITIAL SURETY FOR GROUNDWATER RESTORATION.

A. NRC Reasonably Established A Surety Based On An Estimate of Nine Pore Volumes of Water For Groundwater Restoration.

As we noted above, NRC Staff estimated that nine pore volumes of water would be adequate for groundwater restoration at Section 8 and based HRI's initial surety requirement on that number.[22] Petitioners challenge the nine pore volume finding, but the initial estimate is just that: an initial estimate based on the best information available at the time.

Under its license, HRI must conduct a "large scale groundwater restoration demonstration" at Section 8 and cannot proceed with ISL operations beyond

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rule. *See* 56 Fed. Reg. at 23,374-75. This change was made because the new definition of "background radiation" included non-natural sources of radiation, such as fallout from weapons testing and past nuclear accidents. *Id.*

[22]The surety encompasses other criteria, but groundwater restoration is the only issue raised in this case.

Section 8 until that demonstration is completed and approved by NRC Staff. *See*, *e.g.*, CLI-04-33, 60 NRC at 585-86 (Joint App. at xxx.) *See* LC-10.28 (Joint App. at xxx.) If information gleaned from that demonstration shows that additional pore volumes will be needed, NRC will change LC-9.5, which specifies the required number of pore volumes, to reflect the new amount. Ford Affidavit (January 22, 2001) at ¶4 (Joint App. at xxx); CLI-04-33, 60 NRC at 586 (Joint App. at xxx). In addition to the large-scale demonstration, HRI will also conduct smaller "concurrent" demonstrations. *See* page 21, *supra*. These demonstrations will provide additional information for consideration when conducting the annual surety reviews and for determining groundwater restoration goals.

Moreover, because surety is always an estimate, NRC reviews HRI's surety annually. *See* 10 C.F.R. Part 40, Appendix A, Criterion 9. These reviews consider the rate of inflation, initial restoration efforts, and any changes in the operation not already factored into the surety account. If this review indicates additional funds are needed, the NRC will issue a new license condition requiring HRI to deposit additional funds. *See* LC-9.5 (Joint App. at xxx). As the Commission pointed out in CLI-04-03, any change to a License Condition will involve an opportunity for a hearing. *See* page 28, *supra*.

The Staff estimate of nine pore volumes primarily rested on the Mobil Section 9 Pilot Test, which was conducted near Section 8 and in the same aquifer as the Section 8 site. FEIS at 4-37 (Joint App. at xxx). Petitioners challenge to this estimate relied on data from groundwater restoration projects far afield from the HRI site, *i.e.*, an ISL project in Wyoming and a non-ISL project in Ohio. *See* Ford Affidavit (January 22, 2001) at ¶11 (Joint App. at xxx). Given the technical support (the Mobil test) for NRC Staff's current nine pore volume estimate, the planned demonstration projects at the HRI site, and the requirement for an annual review of HRI's surety, the PO and the Commission reasonably upheld NRC Staff's resolution of the surety issue.[23]

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[23]Petitioners litigated the pore volume issue twice; both when litigating the surety, LBP-99-13, 49 NRC 233 (1999) (Joint App. at xxx), aff'd CLI-00-08, 51 NRC 227 (2000) (Joint App. at xxx), and when litigating groundwater issues. LBP-99-30, 50 NRC 77 (1999) (Joint App. at xxx), review denied, CLI-00-12, 52 NRC 1 (2000) (Joint App. at xxx). *See* pp. xx-xx, *supra*.

Petitioners attempted to litigate the issue a third time in Phase II, but the PO ruled that they were bound by the results of Phase I. LBP-05-17, 62 NRC 77, 102-04 (2005) (Joint App. at xxx–xxx). Additionally, the PO held that NRC's estimate was supported by the record evidence. 62 NRC at 104-05 (Joint App. at xxx–xxx). Petitioners do not challenge that decision here.

B. Petitioners' Claims Lack Merit.

Petitioners raise several challenges to HRI's surety, implicitly challenging the nine pore volume estimate. Pet.Br. 45-52. None has merit.

1. Petitioners claim that NRC Staff conceded the "ineffectiveness" of the nine pore volumes, Pet.Br. 45, and chose this estimate simply because "additional pore volumes achieve only marginal improvements." Pet.Br. 46. That's not right. NRC chose 9 pore volumes as a reasonable estimate based on a review of the Mobil test data. *See* Ford Affidavit of (May 11, 1999) at ¶¶5-9 (Joint App. at xxx). NRC Staff explained why particular parameters that were not restored to primary or secondary standards at the Mobil project were unlikely to prove a concern at the Section 8 site. The PO found the Staff's explanation persuasive. LBP-99-30, 50 NRC at 102-06 (Joint App. at xxx–xxx).

Petitioners argue that the AEA will be violated if groundwater is not restored to "pre-mining baseline or drinking water standards." Pet.Br. 46. But Petitioners cite no evidence that a restoration failure, even if it occurred, would be a "threat to public health and safety" as opposed to an undesirable but non-safety-related environmental impact. In any event, NRC established an initial estimate designed to restore groundwater to either baseline or secondary standards. That was the whole point of the litigation before the PO. *See* page 23-25, *supra*.

Water within a wellfield will almost always not be of "drinking water quality" because of the presence of elevated levels of uranium and radium.[24] Thus, restoration to "baseline" does not necessarily mean restoration to "drinking water quality." A licensee cannot reasonably be required to restore the water to better quality than it was initially. And while restoration to pre-mining baseline is the primary goal, a permissible secondary goal is to restore the water compliance with EPA secondary and primary drinking water regulations. Restoration to these standards does not violate the AEA.

Contrary to Petitioners' claim, NRC did not impermissibly base the nine pore volume estimate on HRI's "financial well-being." Pet.Br. 46, n.32. The PO explicitly found that Staff based the estimate on "technically based analytic factors – *not* cost factors." LBP-05-17, 62 NRC at 106, n.19 (Joint App. at xxx) (Emphasis in original). Petitioners cite statements in both an affidavit and testimony by Mr. Ford for their contention, but Mr. Ford's affidavit simply notes that the amount of water designated as necessary for restoration has an impact on

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[24]Preliminary tests indicate the water inside the Section 8 wellfield is not drinking water quality. *See* Ford Affidavit (May 11, 1999) at ¶22 (Joint App. at xxx). Furthermore, in order to conduct ISL operations, an operator must obtain an EPA aquifer exemption stating that the aquifer, or portion thereof, where operations will occur "cannot now, and will not in the future serve as a source of drinking water." *See* 40 CFR § 146.4. HRI's license requires it to obtain such an exemption before commencing operations. *See* LC-9.14 (Joint App. at xxx).

the amount of surety needed. Ford Affidavit (February 20, 1998) at ¶ 42 (Joint App. at xxx); *see, e.g.*, Ford Affidavit (January 22, 2001) at ¶10 (Joint App. at xxx). And Mr. Ford's testimony (TR 305) merely explains why NRC initially had not required HRI to cease all operations while restoring the first wellfield. He explained that, due to the "phased" nature of the process, a licensee normally funds part of its restoration operations at one wellfield from its proceeds from the ongoing operations (conserving its surety deposit). This observation of normal industry practice has no connection with NRC Staff's nine pore volume estimate.

2. There is no basis for Petitioners' claim that NRC violated its "health and safety regulations" by establishing the initial surety at nine pore volumes. Pet.Br. 47-48. As noted above, NRC had ample technical reason to base the initial surety on the nine pore volumes estimate, and compensates for any uncertainty by requiring HRI to update its initial surety annually. Ford Affidavit (January 22, 2001) at ¶3 (Joint App. at xxx).

More fundamentally, restoration will be accomplished on a "phased" basis, as HRI completes operations at each wellfield. HRI cannot wait until the end of the entire project to start restoration on the first part of the project. Indeed, that is an advantage of the ISL process. HRI will have proceeds from subsequent operations to conduct restoration activities on the initial wellfields and will also

have developed a better understanding of the characteristics of this particular wellfield and the amount of water needed for restoration.

Petitioners ignore NRC's required demonstration projects in Section 8, which may trigger refinements and adjustments as restoration proceeds. Petitioners also ignore the annual surety review, which will assess whether HRI has deposited adequate funds to decommission the ISL recovery operations then in progress. If the funds have fallen below the level necessary for full recovery, or circumstances have changed, NRC will issue a new license condition requiring HRI to deposit additional funds immediately, *see* Part 40, Appendix A, Criterion 9, not just at license termination as Petitioners imply. *See* Pet.Br. at 48. That is in keeping with the "phased" nature of the ISL process.

3. Petitioners allege that the PO and the Commission relied on "arbitrary and capricious" rationales in approving HRI's initial surety on flushing the aquifer with nine pore volumes of water. Pet.Br. 49-52. That argument lacks merit.

Petitioners allege that "the [PO] decided that restoration of only six contaminants (twenty-six percent) to 'secondary groundwater goals' in the Mobil Section 9 test was acceptable. 50 NRC at 103 and 106." Pet.Br. 49. This is an evident misunderstanding of the PO's decision. Actually, the PO found that only six of the parameters did *not* meet secondary goals in the Mobil test. *See* 50 NRC

at 103-104 (Joint App. at xxx). The PO then determined that these six parameters would not, in fact, impact the drinking water in the aquifer. *Id.* Contrary to Petitioners' claims, the PO reasonably found that "it is very likely that . . . water quality will be restored to acceptable levels." LBP-99-30, 50 NRC at 106 (Joint App. at xxx).

Petitioners claim that the PO improperly based his decision on the "professional judgment" of NRC's Staff, alleging that the Staff did not use its judgment, but instead simply concluded that no further benefits would be derived from flushing with additional water. Pet.Br. 50. But as we have shown above, the Staff did not base its nine pore volume estimate on diminishing returns, although diminishing returns were noted. Instead the Staff demonstrated that nine pore volumes was a reasonable initial estimate of the amount of water that was likely to restore the groundwater at the Section 8 site to either baseline conditions or secondary standards. LBP-99-30, 50 NRC at 102-06 (Joint App. at xxx-xxx).

Petitioners also allege that the PO "ignored" substantial evidence that there was groundwater within the proposed mine areas that meets drinking water standards. Pet.Br. 50-51. Quite to the contrary, the PO relied on Petitioners' claims of water purity to demonstrate the nature of the redox reaction occurring in the mine field. For example, the PO contrasted on one hand the elevated levels of

uranium (well above EPA drinking water standards) and radium-226 (double EPA drinking water standards) in water samples at the Section 8 site, with petitioners' claims for the purity of the water outside the mining zone on the other hand. LBP-99-30, 50 NRC at 104-05 (Joint App. at xxx-xxx). The PO concluded that if the water inside the mining field was so contaminated, but the water outside the mining field was uncontaminated (as conceded by Petitioners), it was clear that the elements were being precipitated by the redox reaction. *Id.* In other words, the redox reaction is likely to remove uranium and similar minerals from the water if restored water escapes from the wellfield area. *See generally* FEIS at 4-39 (Joint App. at xxx). It is not unusual for the water in the actual mining area to be undrinkable, but be drinkable only a short distance away. Ford Affidavit (May 11, 1999) at ¶24 (Joint App. at xxx).

Finally, Petitioners complain that the Commission improperly allowed HRI to establish a baseline water quality based only on water measurements within the mining zone, instead of averaging in water measurements from outside the mining zone but inside the property line. Pet.Br. 51-52. Petitioners claim that the Commission's discussion of the water quality within Section 8 in CLI-00-12, 52 NRC at 6 (2000) (Joint App. at xxx) "contradicts" the PO's decision in LBP-05-17, 62 NRC at 97 (Joint App. at xxx). *See* Pet.Br. 52.

But there is no contradiction. The normal practice of determining the baseline conditions is to average a number of samples from wells within the ore zone. *See* page 8, *supra*. The Phase 2 PO's ruling in LBP-05-17 says exactly that. CLI-00-12 denied a motion to reopen Phase I, addressing a challenge to the secondary restoration goal. There is no connection between the two decisions.

* * * * *

In essence, Petitioners disagree with NRC's expert factual assessment that nine pore volumes, and its associated surety, is the best available current estimate for groundwater restoration at the HRI site. The PO and the Commission cited ample record evidence for their findings. "[A]n agency must have discretion to rely on the reasonable opinions of its own qualified experts even if, as an original matter, a court might find contrary views more persuasive." *Marsh*, 490 U.S. at 378. *Accord*: *Citizens for Alternatives to Radioactive Dumping v. DOE*, 485 F.3d 1091, 1099 (10th Cir. 2007). It is not this Court's function to second-guess agency resolution of a fact question, particularly where (as here) "resolution of that question depends on engineering and scientific considerations" and there is "substantial basis" for the agency finding. *FPC v. Florida Power & Light Co.*, 404 U.S. 453, 463 (1972). *See also Utah Envtl. Congress v. Bosworth*, 443 F.3d at 740.

IV. NRC PRESERVED PETITIONERS' HEARING RIGHTS.

Petitioners claim that NRC improperly "deferred" the final decision on whether nine pore volumes is adequate for groundwater restoration surety to a post-hearing resolution, which has "subverted" the AEA's hearing requirement. Pet.Br. 53-55. Essentially, Petitioners allege that if the "demonstration" required by HRI's license condition indicates that additional water will be needed, it will have been deprived of its hearing rights. But Petitioners litigated the issue of groundwater restoration *twice*. In LBP-99-13, the PO found the evidence supported the Staff's finding that an initial surety based on nine pore volumes was reasonable. In LBP-99-30, the PO again found the evidence supported the Staff's initial estimate that nine pore volumes was adequate to restore groundwater to either primary or secondary levels. In short, Petitioners have already had their hearing.

Petitioners ignore an explicit Commission decision in this proceeding that any change in the license conditions after review of the demonstration project will result in an amendment to the HRI license. *See* CLI-04-33, 60 NRC at 593-94, n.52 (Joint App. at xxx-xxx). By law, NRC license amendments trigger interested persons' right to seek an agency hearing. *See id.*; 42 U.S.C. §2239(a). Thus, if NRC later determines that more (or fewer) pore volumes of water are required,

NRC will amend the license by issuing a new license condition. Thus hearing rights will attach to proposed changes in the pore volume requirement. If, based on the demonstration results or other factors, NRC determines that no change is needed, Petitioners may file a petition under 10 C.F.R. § 2.206 seeking to amend the license and increase the surety.

V. NRC'S FEIS ADEQUATELY ADDRESSED POSSIBLE INCOMPLETE GROUNDWATER RESTORATION.

Petitioners argue that NRC violated NEPA because the FEIS failed to address the environmental impacts of incomplete groundwater restoration. Pet.Br. 62-63. Petitioners also allege that the PO improperly dismissed their NEPA claims solely because its AEA arguments were "invalid." Pet.Br. 63. Both claims lack merit.

First, Petitioners never raised the "incomplete groundwater restoration" claim on appeal to the Commission – which means they cannot raise it in this Court. *See Silverton Snowmobile Club v. U.S. Forrest Service*, 433 F.3d 772, 783 (10th Cir. 2006.) Second, contrary to Petitioners' claims, the FEIS explicitly addresses the potential impacts of inadequate groundwater restoration. *See* FEIS at

4-113 (Joint App. at xxx). As the Commission pointed out when reviewing LBP-99-30,

> the FEIS fully discloses . . . that "[s]ignificant adverse effects to groundwater quality would result if an excursion (either horizontal or vertical) occurs or if, after routine mining, water quality is not restored." FEIS at 4-113.

CLI-01-04, 53 NRC at 65 (Joint App. at xxx). The FEIS notes that "degradation of water quality in the ore-bearing aquifer" is "[p]erhaps the most significant potential groundwater impact" from ISL mining. FEIS at 4-15 (Joint App. at xxx). Groundwater impacts from ISL activities are "related to the identification, control, and clean-up of excursions," which are "unanticipated releases of mining solutions that move beyond the 'well field area.'" *Id.* The FEIS contains a detailed discussion of the potential for excursions at both Section 8 and Section 17. FEIS at 4-54 to 4-58 (Joint App. at xxx-xxx).

And as the Commission further noted, the FEIS acknowledged that (1) "[s]uccessful restoration of a production-scale ISL well-field has not previously occurred,"[25] and (2) "site specific tests conducted by HRI have not demonstrated that the proposed restoration standards can be achieved at a production rate."

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[25]Subsequent to preparation of the FEIS, groundwater restoration at the Bison Basin Mine in Wyoming has been approved by NRC and the State. *See* Ford Affidavit (March 12, 1999) at ¶16 (Joint App. at xxx).

CLI-01-04, 53 NRC at 65 (Joint App. at xxx). The Commission pointed to mitigative measures discussed in the FEIS and concluded that they reduced the likelihood and severity of any adverse impacts. *Id.* *See also* FEIS at 4-60 – 4-63 (Joint App. at xxx-xxx); 4-121 – 4-122 (Joint App. at xxx-xxx); 4-127 (Joint App. at xxx). This review is forthright, complete, and fully satisfies NEPA's "hard look" requirement.

Second, Petitioners mischaracterize the PO decision they challenge. In their presentation on groundwater issues under the AEA, Petitioners claimed that the FEIS did not adequately address the impacts on groundwater. *See* Amended Groundwater Brief (January 18, 1999) at 65-68 (Joint App. at xxx–xxx). They then raised similar issues in their presentation on NEPA issues. *See* Brief on NEPA Issues (February 19, 1999) at 46-50 (Joint App. at xxx–xxx). The PO held that Petitioners' NEPA arguments in their groundwater brief were simply a "recapitulation of themes" and "do not state separate grounds for this argument." *See* LBP-99-30, 50 NRC at 109 (Joint App. at xxx). Essentially, the PO held that Petitioners based their NEPA claims on already-rejected AEA claims, not on separate, NEPA-only claims. Having resolved those issues once, he reasonably rejected them the second time later in the same opinion. LBP-99-30, 50 NRC at 113 (Joint App. at xxx).

The Commission took review of the NEPA issues in LBP-99-30, *see* CLI-01-04, 53 NRC 31, 44 (2001) (Joint App. at xxx), and affirmed the PO. After noting Petitioners' claim that the FEIS underestimated the particular impacts of the project, the Commission found that in actuality these "NEPA claims . . . consist essentially of fact-specific, technical arguments, already rejected by the Presiding Officer and, in many cases, also by the Commission." 53 NRC at 45 (Joint App. at xxx). "A specific example is [Petitioners'] claim that the FEIS underestimates . . . the impacts to groundwater. These claims are rooted directly in specific, technical, health, and safety issues resolved . . . by earlier [PO] decisions." *Id.*

Simply put, when the PO – and the Commission – rejected Petitioners' technical, AEA-based arguments on groundwater impacts, there were no independent NEPA arguments left to address. It is true, as Petitioners argue (Pet.Br. 65) that NEPA and the AEA are "independent statutes," but that hardly means that NRC was required to repeat, under the rubric of NEPA, the very same analyses that it had done already under the AEA.

VI. THE NAVAJO NATION'S CLAIMS ARE EITHER UNSUPPORTED OR ARE NOT PROPERLY BEFORE THIS COURT.

The Navajo Nation's ("the Nation") *amicus* brief attempts to raise one issue – NRC consultation with the Nation – not raised in Petitioners' opening brief. But this Court limits *amici* to issues raised by the parties. *Wyoming Farm Bureau Federation v. Babbitt* 199 F.3d 1224, 1230, n.2 (10th Cir. 2000).[26] We can find no record that this issue was raised by any party to the NRC hearing or by any party to this lawsuit.

The Navajo Nation's other claims are not well-founded. First, the *amicus* brief claims that the Navajo Nation continues to suffer from previous mining activities. *See* Nation Brief ("NB") at 5-9. But NRC did not license those previous mining activities and the Nation's brief makes no claim that any proposed action reviewed here contributed to that alleged injury. Second, the Nation states that in its

> considered opinion, . . . but for the determination of the NRC that the non-naturally-occurring radioactive

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[26]Petitioners filed a "Statement," dated July 26, 2007, claiming to "adopt" the Nation's arguments. But no authority allows a party to "adopt" arguments filed by an *amicus* after both parties have filed their briefs. The prohibition on an *amicus* making new arguments would be worthless if a party could simply file a post hoc "we adopt everything the *amicus* says" statement after briefing is over. And such an approach would evade FRAP 32's word-count limit.

> materials . . . from previous mining operations can be considered "background emissions [sic]," . . . United Nuclear Corporation and HRI would have been compelled to take, at their cost, corrective measures.

NB at 9-10. But the Nation cites no authority for that statement. The Nation overlooks NRC's lack of jurisdiction over conventional mining activities and the resulting mine debris. The Nation seemingly urges NRC to act outside its own statutory jurisdiction to force HRI to remove mining waste that it did not create.

The Nation also alleges that excluding existing radiation from mine waste from TEDE allows NRC to issue a license without taking into account the effect the project will have on the public. NB at 11. But the impacts from those mine wastes will be present *regardless* of whether NRC issues the license. Denial of the license will not reduce the impacts to the public; instead, denial of the license will only eliminate the impacts to the public from the licensed activity. But, as the PO conclusively demonstrated, the licensed activity will have little, if any, impact on the public. *See generally*, LBP-06-01, 63 NRC at 69-71 (Joint App. at xxx-xxx).

The Nation also claims that the decision on surety "amounts to an experiment on Navajo people" and that NRC "allowed HRI to base its surety requirement on groundwater restoration models that failed." NB at 12. But NRC based its decision on the Mobil test, run in the same aquifer and in a nearby

location. As we noted above, the PO found that it provided a technical basis for the initial estimate for the first wellfield in Section 8. And as we also have noted several times, HRI must provide a large-scale demonstration project with the first wellfield in Section 8 and a smaller demonstration project in each Section. There is no "experiment" with the Navajo people or the Navajo Nation.

Finally, the Nation argues that NRC failed to consult appropriately with the Nation in issuing HRI's license. NB at 13-16. As we noted above, Petitioners did not raise this argument and we have no record that it was raised below. The Nation was free to participate in the NRC proceedings either as a full party, as did Petitioners, or as a governmental entity under 10 C.F.R. § 2.315(c), which gives governmental entities significant participation rights, including the right to present evidence and appeal decisions to the Commission. The Nation did neither.

In any event, contrary to the Nation's claim that "[t]here has been no consultation at all[,]" NB at 16, the record makes plain that NRC consulted with the Nation, as discussed in detail in LBP-05-26, 62 NRC 442, 451-54, 463-70 (2005) (Joint App. at xxx– xxx, xxx– xxx), and FEIS, Appendix C (Joint App. at xxx). While the primary topic of consultation was compliance with the National Historic Preservation Act, 16 U.S.C. § 470, *et seq.*, nothing prevented the Nation from raising other issues related to the HRI license.

CONCLUSION

For the foregoing reasons, the petition for review should be denied.

Respectfully submitted,

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September 20, 2007

STATEMENT REGARDING ORAL ARGUMENT

The Federal Respondents believe that the issues in this case are sufficiently complex that oral argument would be beneficial to the Court in its consideration of these issues. Therefore, the Federal Respondents respectfully request that this Court schedule oral argument in this case.

CERTIFICATE OF COMPLIANCE

Counsel for Respondent hereby certifies that the foregoing Brief for the Federal Respondents satisfies the requirements of Rule 32(a)(7) of the federal Rules of Appellate Procedure. The Brief was prepared in proportional Times New Roman font of 14 characters per inch, and, excluding the parts of the brief exempted by Rule 32(a)(7)(iii) of the Federal Rules of Appellate Procedure, contains 13,987 words, according to Corel Wordperfect X3.

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CERTIFICATE OF SERVICE

I declare under penalty of perjury that I filed the "Uncited Preliminary Brief for the Federal Respondents" in Case No. 07-95056 by causing one (1) copy to be sent to this Court by overnight delivery service, and one (1) copy of the brief on the following counsel by overnight delivery service:

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Dated: September 20, 2007

Briefing Before the Commission by Office of Federal and State Materials and Environmental Management (FSME): Programs, Performance and Plans, May 7, 2007

Excerpts from Transcript (ML071340328)

Excerpts are the discussion of the proposed Generic Environmental Impact Statement (GEIS) for ISL Uranium Recovery.

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MR. RATHBUN [Director, Division of Intergovernmental Liaison and Rulemaking Office of Federal and State Materials and Environmental Management Programs]:

DILR [Division of Intergovernmental Liaison and Rulemaking] will work with the division of Waste Management Environmental 10

Protection following the Commission's policy decision to complement the in-situ 11

leach proposed rulemaking as expeditiously as possible during the forthcoming 12 year. We will continue coordination with the States and Federal agencies. 13

We will increase coordinated outreach with Tribal governments. We will 14 continue outreach with individual Tribal governments and we will increase 15 interactions with the National Congress of American Indians attending and making 16 presentations at Tribal gatherings. DILR will coordinate the delivery of guidance 17 associated with the rulemakings to allow for timely issuance. That's a list of some 18 of the items that DILR will be addressing in the upcoming year. 19

Our next speaker is Larry Camper, Director of the Division of Waste 20 Management and Environmental Protection. 21

MR. CAMPER [Director, Division of Waste Management and Environmental Protection, Office of Federal and State Materials and Environmental Management Programs]:

Slide 18, please. As a result of the reorganization, 22

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the Division of Waste Management and Environmental Protection has 1

incorporated Uranium Recovery into this diverse program, which includes 2 decommissioning, environmental protection, performance assessment, waste 3 incidental to reprocessing, and low level waste. This allows us to combine skills 4 that are common to the division with those of Uranium Recovery in a more efficient 5 manner. 6

In FY06 we consolidated the decommissioning of all power test and 7 research reactors and uranium recovery facilities undergoing decommissioning, 8 both Title 1 and Title 2 sites within the comprehensive decommissioning program. 9

In FY07 and beyond we will work with the Agreement States to include 10 more information on decommissioning facilities in their jurisdictions within the 11 annual report. Nine different companies have expressed their intent to submit now 12 14 applications, new license applications for in-situ leach facilities and/or 13 conventional facilities in FY08 and '09. 14

Currently we have resources and a strategy to conduct the licensing 15 evaluations. We are looking at ways to facilitate the development of 16 environmental impact statements including the use of a generic environmental 17 impact statement for uranium recovery licensing supplemented by site specific 18 environmental assessments to improve our efficiency and address limited 19 resources. 20

In addition in FY08 and '09, we're seeking a level of resources to fully 21 complete environmental reviews. The environmental workload – 22

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COMMISSIONER MERRIFIELD: Mr. Chairman, for just a second, I think this is a noteworthy development. One of the things that the EDO's office 2 conducts on the NRO side of the house is we keep a list now of all the utilities that 3 have an interest in submitting COL applications and having read this, getting 4 prepared for the briefing today, it strikes me that we may have an analog listing of 5 mining companies that are interested in these types of facilities so that the 6 Commission can keep track of that on a more regularized basis. 7

MR. CAMPER: I'll respond to that a little bit later. The environmental 8

workload has increased significantly due to additional licensing actions that were 9
not originally forecast for the fuel cycle decommissioning and low-level waste area. 10
To best address this issue where attempting to establish rules of engagement to 11
guide all of our environmental work and develop unique approaches to maximize 12
the number of environmental reviews that we can complete. 13

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MR. CAMPER:

In terms of the upcoming year there are some issues that will come before the
Commission for decisions or information. Currently the staff is engaged in two 19
high priority rulemakings: the in-situ leach rulemaking was designed to reduce dual 20
regulation of groundwater at in-situ leach facilities; however, as the Commission is 21
aware, we recently held meetings with the EPA and the National Mining 22

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Association on this topic and we are currently awaiting a Staff Requirements 1
Memorandum for a path forward. 2

As I mentioned earlier, we are examining the use of a generic 7
environmental impact statement for uranium recovery licensing reviews. However, 8
existing uranium recovery licensees would have to bear the cost of the generic 9
environmental impact statement because of the generic nature of the work. 10

In essence, current licensees would be paying for an activity that would 11
support their future competitor. Therefore, the staff will seek Commission approval 12
to take the generic environmental impact statement off the fee base and instead 13
recover the cost through the surcharge assessed to all NRC licensees paying Part 14
171 fees. 15

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MR. MILLER [Director, Office of Federal and State Materials and Environmental Management Programs]**:**

In FY08, we will temporarily have to build a materials licensing backlog for 21
the first time in about 15 years. This means that we won't be able to complete as 22

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many cases as we will receive and that our timeliness metrics will likely be 1

compromised. We hope to fully restore these resources in FY09 in order to meet 2 our metrics. 3

We'll also need to find innovative solutions in how we do our environmental 4 reviews. Perhaps through the use of generic environmental impact statements for 5 uranium recovery licensing; you heard that from Larry. 6

We realize that FSME is not the only piece to the NRC puzzle and that 7 budget decisions need to be made in a few months from the perspective of what is 8 best for the agency and not any one program office. FSME will let the 9 Commission know immediately if key assumptions or external factors begin to 10 perturb our ability to achieve our basic mission. 11

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COMMISSIONER MERRIFIELD: Thank you, Mr. Chairman. I'll 13 pickup where I left off and talk to Larry a little bit. On slide 18, you mentioned that 14 there are nine companies that expressed an intent to apply - you're now saying 14 15 ISL licensing either in-situ leach or conventional uranium mining. Clearly, that is 16 closely connected with the dramatic increase in the price of uranium over the 17 course of the last year. 18

You outlined the idea of developing a generic environmental impact 19 statement, particularly as relates to ISL mining which I think makes a lot of sense. 20 My only concern and perhaps it's caution, that we not too narrowly focus that GIS 21 in order to make sure that the scope is such that we can address the majority of 22

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potential sites that may be out there. I fear that if we tried to tailor it too close, it 1 may not have the broad reach that would otherwise be useful for us in the long 2 run. 3

I also appreciate the fact you're talking about dealing with issues of 4 requiring existing licensees to pay for that generic environmental impact 5 statement. I've long felt that while we have a lot of unfortunate burdens that we 6 place on our licensees because we are a fee based agency, I think in particular it 7 has been difficult for some of the folks who are involved in mining. I think the 8

direction you all are thinking about in terms of taking them off the fee base is 9 certainly something I would want to support. 10

I did have that one suggestion that you said you were going to get back to, 11 but I didn't hear it. That is how are you going to help us track these on a more real 12 time basis so the Commission can have some understanding about where it's 13 going. 14

MR. CAMPER: Let me say that I share clearly the concern that you 15 just expressed about the GEIS. In structuring it we do want it to be broad enough 16 to capture the technology that is being used, the geographical consideration, the 17 groundwater consideration and the like because ultimately we'll have to do either 18 site specific EAs preferably or site specific EISs as a function of how well bounding 19 that GEIS is. When we do that, we'll try to write it as broadly as possible with that 20 in mind. Good point. 21

It is a dynamic industry. This number 14, literally, is just a number 22

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we've learned in the last day or two. We have a list of the 14 that intend to pursue 1 either ISL and/or conventional. We have another four that are restart. We 2 maintain that list. We spoke to the industry during a workshop back in February, 3 asked them to share with us letters of intent at the earliest opportunity so we can 4 better plan and have a better idea of what is in fact actually coming. We maintain 5 that list. 6

You cited a particular system as a way of keeping track of that. We can 7 work toward including it in that system or something like it to make sure that we 8 pass that information up through our system including the Commission. It is 9 dynamic and frankly, I expect the numbers to change again as the price of 10 uranium continues to climb presumably. 11

COMMISSIONER MERRIFIELD: As you look at the history of 12 uranium mining, too, it can go dynamic in multiple directions. I think one of the 13 things that the Commission is mindful of is making sure that we appropriately 14 target ourselves on one end of it where on the reactor side we've got the right 15

resources, recognizing some greater degree of confidence that those will 16
ultimately come in. 17

I think on the uranium side because of the perspective and I use that word 18
in its alternative form, prospective nature uranium mining, I think we do need to be 19
a little bit more careful in our expectations of that particular one. I would follow up 20
on your response, and I don't have a bottom-line answer to it today, nor do I 21
expect one from you. 22

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I know there's been some tension in terms of the need for environmental 1
impact statements relative to specific ISL applications vise [sic] earlier on we had done 2
environmental assessments. I'm not entirely certain - I have some understanding 3
of it and we need not get into detail here, but from my own view point I do think 4
that the old approach of environmental assessment was sufficient without having 5
to go with a more expansive notion. But to the extent we can cover some of this in 6
the guise that would certainly make everybody's life a bit easier. 7

MR. CAMPER: The good news is based on our discussions with the 8
Office of General Counsel while these environmental impact statements are 9
required for either methodology consistent with Part 51, the clearest thing is that 10
we can address this via a generic environmental impact statement. We are 11
proceeding accordingly, because frankly it makes the most sense in terms of 12
efficiency and has the highest likelihood of success on the road. 13

Issue of an ISL operation impacting two States--one of which is Agreement State

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CHAIRMAN KLEIN: Okay. Question for Larry. In terms of uranium mining, I
was recently visited by some companies that do in-situ leach mining and 15
what was interesting was the fact that they're looking at some satellite systems 16
and sometimes they might be right on the border between an Agreement State 17
and a non-Agreement State. How do you handle those? 18

MR. CAMPER: As the application process becomes a reality and we 19

find ourselves engaged in discussions with sites, one of the first things we're going 20
to be doing, of course, is having dialogue with the Agreement State. We have a 21
licensing responsibility but they clearly are a hugely vested stakeholder as are 22

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others near the site. 1

The simple answer is as this proceeds along and we get a clear indication 2
of applications coming in, we will initiate interactions with the various stakeholders 3
to ensure that we're getting their views and so forth. We know, for example - on 4
the one hand there is a lot of enthusiasm for uranium recovery but on the other 5
hand there's also a great deal of stakeholder interest out there already and we can 6
predict that there will be certain sites that will be subject to hearings, probably 7
three or four if we look out here. On your point, it's going to require 8
communication and outreach on our part. 9