UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD PANEL

Before Administrative Judges:
Peter B. Bloch, Presiding Officer
Thomas D. Murphy, Special Agent

In the Matter of:	)	
HYDRO RESOURCES, INC. 2929 Coors Road, Suite 101 Albuquerque, NM 87120	)	Docket No. 40-8968-ML ASLBP No. 95-706-01-ML

HYDRO RESOURCES, INC.'S RESPONSE TO INTERVENORS' NOVEMBER 9, 1998 BRIEFS IN OPPOSITION TO APPLICATION FOR A MATERIALS LICENSE WITH RESPECT TO LIQUID WASTE DISPOSAL ISSUES

I. BACKGROUND

A. Factual Background

On April 13, 1988, Hydro Resources, Inc. ("HRI" or "Licensee") applied to the U.S. Nuclear Regulatory Commission ("NRC" or "Commission"), for a general license to construct and operate in-situ leach ("ISL") uranium mining facilities on property in "Section 8," approximately six miles north of the town of Church Rock, New Mexico.[1] Later, HRI amended its application to include: (1) ISL mining operations on two lease properties, "Unit 1" and "Crownpoint," near Crownpoint, New Mexico; and, (2) a central processing operation at the

[1] Application for Materials License, ACN No. 8805200339, (April 13, 1988).

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"Crownpoint" site where yellowcake will be dried and packaged.[2] Finally, on September 28, 1992, HRI further amended its application to request that it be permitted to perform ISL mining operations in the northeast quarter of "Section 17" near Church Rock.[3]

In response to a request from the NRC Staff, on September 30, 1996, HRI submitted a consolidated operation plan ("COP") for the project.[4] In response to additional requests for information, HRI submitted two revised COPs in 1997[5] discussing the CUP and the ISL process. We provide a general overview of the ISL process, as discussed in COP Rev. 0.0, as background.[6]

ISL mining has been practiced for over three decades and currently is the primary extraction technology for commercial uranium production in the United States.[7] ISL mining provides a safe and cost-effective method of recovering uranium contained within a minable, confined aquifer system. As the NRC legal Staff has noted, ISL mining does not involve crushing or grinding of any ore, nor does it produce mill tailings.[8] For these and other reasons,

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2 U.S. Nuclear Regulatory Commission, Safety Evaluation Report, Hydro Resources, Incorporated, License Application for Crownpoint Uranium Solution Mining Project, McKinley County, New Mexico, Docket No. 40-8968 ("SER") ACN No. 9712310295 (Dec. 1997) at 1.

3 See Hearing Rec. ACN No. 9211300077 (Sept. 28, 1992).

4 HRI, Inc., Crownpoint Uranium Project Consolidated Operations Plan, Revision 0.0 ("COP Rev. 0.0") ACN No. 9701160106 (Sept. 30 1996). The entire project is referred to as the Crownpoint Uranium Project ("CUP").

5 See HRI, Inc., Crownpoint Uranium Project Consolidated Operations Plan, Revision 1.0 ("COP Rev. 1.0") ACN No. 9705220214 (1997); HRI, Inc., Crownpoint Uranium Project Consolidated Operations Plan, Revision 2.0 ("COP Rev. 2.0") ACN No. 9708210179 (1997).

6 There are four documents that are critical to consideration of HRI's license application and, consequently, to Intervenors' challenge thereto: the Safety Evaluation Report ("SER"), the Environmental Impact Statement ("EIS"), the Consolidated Operations Plan ("COP"), and the license application ("Application"). Curiously, Intervenors' Briefs make no mention of the SER, the document containing much of the technical information Intervenors claim is lacking.

7 HRI, and/or its parent company, Uranium Resources, Inc. ("URI"), has engaged in ISL uranium mining since 1977. URI presently conducts ISL uranium mining in Texas pursuant to Texas Dept. of Health Radiation Control, License No. LO3653.

8 1980 ISL Memorandum, at 2-3.

the "potential for environmental impacts due to in situ uranium mining appears to be minor."[9] This is because, although ISL mining accomplishes the same goals as conventional mining, i.e., bringing uranium to the surface for beneficiation and processing, it does so in a very different manner. First, after locating a uranium ore body, the ISL operator conducts a subsurface investigation to evaluate whether the ore is technically and economically recoverable. If it is, the operator will design and construct a wellfield to bring the uranium to the surface. Essentially, the technique involves the installation of two types of wells in the ore zone. The mine operator uses injection wells to inject into the mineralized zone a solution known as lixiviant. The lixiviant consists of groundwater containing dissolved oxygen and carbon dioxide and has similar physical and chemical characteristics as club soda. At the same time, a production well draws the lixiviant through the ore body. These wells create a circuit that continually draws and injects water through the ore zone, oxidizing and dissolving the uranium, thus mobilizing it and drawing it to the surface.

In the aboveground portion of an ISL facility, the first stage of processing involves running the "pregnant lixiviant," i.e., the lixiviant containing uranium, through an ion exchange ("IX") unit containing resin which removes uranium from the solution. Specifically, as the "pregnant" solution passes through the IX units, the uranium attaches to the IX resin. The barren lixiviant from which uranium has been removed is returned to the injection circuit and pumped back into the ground for further uranium recovery. The ion exchange resin containing uranium is

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9 R.S. Popielak and J. Siegel, "Economic and Environmental Implications of Leakage Upon In Situ Uranium Mining," Mining Engineering 800, 804 (Aug. 1987). Moreover, the low hazard associated with the ISL technique suggests that "[t]he concept of natural ground-water quality restoration may have particular merit in uranium leaching. It is believed that, under the proper circumstances, most of the objectionable elements that have been introduced or mobilized during leaching will be removed by reprecipitation, ion exchange, adsorption, or reduction . . .." Geraghty & Miller, "Ground-Water Elements of In Situ Leach Mining of Uranium," at 76 (Aug. 1978). Consistent with this sentiment, more than 25 years of ISL uranium mining in the United States has resulted in no significant impacts to human health or the environment and Intervenors are unable to cite any. In evaluating Intervenors' complaints, it is important to appreciate the extremely low-risk nature of this activity.

trucked to the central processing plant for stripping, or "elution" by passing a concentrated chloride salt solution over the resin containing uranium which allows the chloride ions to replace the uranium ions on the resin.[10] Once eluted, the ion exchange resin is trucked back to the IX unit for reuse, while the resulting material, a rich eluate, is treated with ammonia to precipitate the uranium. The precipitate is then dewatered, filtered, and dried to produce uranium oxide concentrate, a.k.a. "yellowcake."

Several liquid wastes are produced at an ISL facility. During the mining process, slightly more water is removed from the ore zone than is injected. This net withdrawal, or "bleed," creates a cone of depression, or pressure sink, that prevents production fluids from leaving the mining zone. This also brings fresh water into the mining zone to inhibit the build-up of contaminants that reduce the efficiency of the mining process. The bleed is treated to remove uranium and then the water is discharged to certain ponds where it will evaporate or be held for deep well injection. The water may also be treated using reverse osmosis ("RO") and/or brine concentration to produce "distilled" water that is suitable for return to the aquifer outside the monitor well ring. Subsequent to evaporation, the remaining precipitated sludge will be disposed of at a uranium mill tailing disposal facility as 11e.(2) byproduct material pursuant to 10 C.F.R. Part 40, Appendix A, Criterion 2.

A second type of liquid waste is generated during groundwater restoration when uranium mining operations cease. This waste is commonly referred to as "restoration water." "Groundwater sweep," a form of groundwater restoration, requires the use of existing wells to remove contaminated water from the ore zone which allows native groundwater to flow in to replace the contaminated water. The restoration water thus removed will be treated in the same

[10] "Elution" is the removal of uranium from the resin using a chemical solution known as "elueant." Paul W. Thrush and the Bureau of Mines Staff, A Dictionary of Mining, Mineral, and Related Terms (1968).

manner as the "bleed" or process water, using reverse RO and/or brine concentration. The restoration water is then either discharged to ponds for evaporation, deep well injected, or, following additional treatment, disposed of by application or surface discharge. Treated restoration water, unlike process water, may also be surface discharged.[11]

On February 28, 1997, NRC Staff, in accordance with the National Environmental Policy Act, 42 U.S.C. §§ 4321, et seq. ("NEPA"), issued a Final Environmental Impact Statement ("FEIS") for the proposed project based on the requirements of NEPA, NRC's "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," 10 C.F.R. Part 51, the Bureau of Land Management's ("BLM") "Surface Exploration, Mining, and Reclamation of Lands," 25 C.F.R. Part 216, and "Solid Minerals Exploration and Mining Operations," 43 C.F.R. Part 3590.[12] In sum, the NRC Staff concluded in the FEIS that the potential significant impacts of the CUP could be mitigated through license conditions; therefore, NRC determined that HRI should be issued a combined source and 11e.(2) by-product material license from NRC and mineral operating leases from BLM and the Bureau of Indian Affairs ("BIA").[13]

Following completion of the FEIS, in December of 1997, NRC's Office of Nuclear Material Safety and Safeguards, Division of Waste Management, issued a Safety Evaluation

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[11] With the exception of surface discharge, HRI may elect to manage its wastewater streams by a variety of the described methods, depending on production flowrate and availability and cost of technologies at any given time during operations. At each COP location, HRI will install equipment required to initially treat all water with brine concentration and reverse osmosis and to discharge the treated water to evaporation ponds. See COP 2.0 at 28.

[12] NUREG-1508, "Final Environmental Impact Statement to Construct and Operate the Crownpoint Uranium Solution Mining Project, Crownpoint, New Mexico," Feb. 1997 ("FEIS"). NRC published a "Notice of Availability of Draft Environmental Impact Statement: Notice of Opportunity for Hearing" in the Federal Register on November 14, 1994, more than two years prior to the issuance of the FEIS. See, Hydro Resources, Inc., LBP 98-9, 47 NRC 261, 264 (1998) ACN No. 9703200270. Notably, Environmental Impact Statements generally have not been required in connection with ISL mining operations. In this case, allottees' land is under the jurisdiction of the Bureau of Indian Affairs ("BIA"), and BIA required that an EIS be prepared. Letter from Area Director, Bureau of Indian Affairs (June 18, 1992).

[13] FEIS at xxi.

Report ("SER") based on its review of HRI's license application and COP Rev. 2.0 and the regulations in 10 C.F.R. Parts 19, 20, 40, and 71, stating that "[t]he SER supports the staff's finding that issuing the license to HRI will be accordance with these regulations, and with all applicable safety requirements of the Atomic Energy Act of 1954 ("AEA"), as amended."[14]

In accordance with the SER, and based in part on the FEIS, on January 5, 1998, the NRC Staff issued a source material license to HRI containing a variety of administrative conditions permitting HRI to construct and operate ISL mining facilities at Sections 8 and 17 near Church Rock, New Mexico, and at Unit 1 and Crownpoint near Crownpoint, New Mexico, on an incremental basis: development and operation are scheduled to occur on an incremental basis (well field by well field) over a twenty-year period. Pursuant to the license, construction and operation are to occur at Section 8 at Church Rock first, as the license prohibits HRI from performing certain aspects of the ISL mining technique at Unit 1 and Crownpoint prior to demonstrating successful groundwater restoration at Section 8.[15]

Eastern Navajo Dine' Against Uranium Mining ("ENDAUM"), Southwest Research and Information Center ("SRIC"), and Grace Sam and Marilyn Morris (jointly, hereinafter "Intervenors") filed motions to intervene and requests for hearing in the instant matter. In their Second Amended Request for Hearing, Petition to Intervene, and Statement of Concerns, (Aug. 19, 1997), ENDAUM and SRIC stated the crux of their argument:

> Petitioners are concerned that, contrary to the requirements of 10 C.F.R. § 40.31(h) and the Introduction to Appendix A to 10 C.F.R. Part 40, [HRI] has failed to provide "proposed written specifications relating to <u>milling operations and the disposition of the byproduct material</u> to achieve the requirements and objectives

[14] U.S. Nuclear Regulatory Commission, Safety Evaluation Report, Hydro Resources, Incorporated License Application for Crownpoint Uranium Solution Mining Project, McKinley County, New Mexico, Docket No. 40-8968 ("SER") ACN No. 9806090094 (Dec. 1997) at 1-2.

[15] <u>Hydro Resources, Inc.</u>, CLI-98-8, 47 NRC 314, 318-19 (1998) ACN No. 9806090094.

> set forth in Appendix A of [Part 40]," and to "clearly demonstrate how th[os]e requirements and objectives . . . have been addressed." 10 C.F.R. § 40.31(h).

Second Amended Request for Hearing, Petition to Intervene, and Statement of Concerns, at 77 (Aug. 19, 1997) (emphasis added).

In response to Intervenors' filings, the Commission appointed a Presiding Officer to conduct an informal hearing pursuant to Subpart L of the Commission's procedural regulations in 10 C.F.R. Part 2. Following a challenge by HRI to the standing of Intervenors, the Presiding Officer admitted the Intervenors and began developing what has turned out to be a voluminous record.

On September 17, 1998, a scheduling conference was held in Crownpoint, New Mexico,[16] to address how to proceed with the challenge brought by Intervenors to HRI's license. Following the scheduling conference, on September 22, 1998, the Presiding Officer issued an Order granting, in part, HRI's, May 13, 1998 and June 4, 1998 requests[17] for bifurcation of the licensing proceeding, such that Intervenors are permitted to submit written presentations with respect to "any aspect of the HRI license concerning operations at Church Rock Section 8 or with respect to the transportation or treatment of materials extracted from Section 8," but are precluded from presenting concerns relating only to Church Rock Section 17, Unit 1, or the Crownpoint sections at this time. Under the September 22 Order, Intervenors may also raise "any issue that challenges the validity of the license issued to HRI."[18]

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[16] See Transcript of Prehearing Conference of Hydro Resources, Inc. ACN No. 9809280059 (Sept. 17, 1998).

[17] See HRI's Request for Partial Clarification or Reconsideration of Presiding Officer's Memorandum and Order of May 13, 1998; and Request for Bifurcation of the Proceeding ACN No. 980609130 (June 4, 1998).

[18] In support for his conclusion, the Presiding Officer recognized HRI's and the NRC Staff's argument that, unlike reactor licensing, the site specific nature, as well as well field by well field progression of in-situ leach mining projects results in many technical details concerning operations being determined only when a well field has been constructed and is ready to begin production. See September 22 Order at 2; Bifurcation Motion at 2-11; NRC

In response to the September 22 Order, on September 30, 1998, Intervenors filed a Joint Request for Directed Certification ("the Request") of the decision by the Presiding Officer to bifurcate the proceeding. HRI and NRC Staff filed responses opposing the Request on October 8, 1998. On October 7, 1998, Intervenors filed a Petition for Interlocutory Review of Memorandum and Order (Scheduling and Partial Grant of Motion for Bifurcation) of September 22, 1998 and Request of Stay (hereinafter, "the Petition") with the Commission. On October 23, 1998, the Commission denied Intervenors' request stating that the proceedings before the Presiding Officer should continue as scheduled.

In accordance with the November 5, 1998 Joint Notice of Schedule for Written Presentations, Intervenors filed briefs on November 9, 1998 arguing, in sum, that HRI's license application fails to comply with NRC health, safety and environmental regulations and is not supported by an adequate FEIS as required by NEPA with respect to liquid waste disposal issues and that, therefore, HRI's license should be revoked.[19]

Intervenors are wrong on the facts and the law. As HRI demonstrates herein:

> * The regulations cited by Intervenors are designed, primarily, to ensure the safe, long-term disposition of mill tailings in on-site impoundments. No on-site disposal of 11e.(2) byproduct material is contemplated by this license. As discussed below, some of these regulations are not even applicable to ISL operations;
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> * To the extent the cited regulations apply to ISL operations, the regulations are intended to be performance-oriented and are designed to provided maximum flexibility to achieve the required result. Compare, for example, the prescriptive

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Staff Response to HRI's Motions for Reconsideration and Bifurcation at 4-16 ACN No. 9807020189 (June 26, 1998).

[19] Eastern Navajo Dine Against Uranium Mining's and Southwest Research and Information Center's Brief in Opposition to Hydro Resources, Inc.'s Application for a Materials License With Respect to Liquid Waste Disposal Issues, at 1-2 ACN No. 9811130018 (Nov. 9, 1998) ("ENDAUM and SRIC Phase I Brief"); Initial Written Presentation of Grace Sam and Marilyn Morris, at 15 ACN No. 9811130062 (Nov. 9, 1998) ("Sam and Morris Phase I Brief").

mandates contained in 10 CFR Part 50 with the criteria set forth at 10 C.F.R. Part 40, Appendix A;

* Pursuant to 10 C.F.R. section 40.32, NRC shall issue a license when the applicant is qualified and experienced, procedures and facilities are adequate to protect public health, issuance is not inimical to national defense or public health or safety, and the benefits outweigh the environmental costs.

* Evaluation of potential impacts should correspond to the potential significance of those impacts. NRC expertise and experience with ISL mining makes exhaustive analysis of factual minutiae unnecessary. In point of fact, review of the record in the context of the risks presented and relevant experience shows that the record contains more than adequate information to provide reasonable assurance that the proposed options for waste management and pond design are protective of human health and the environment and that HRI satisfies section 40.32.; and

* Although excruciating detail is unnecessary to provide the required reasonable assurance and the information contained in the record presently is more than adequate to assess the potential impacts of the ISL mining for which the license is sought, Intervenors' mere allegations – generalized and speculative "what ifs" – in any event, are not sufficient to defeat a license application supported by the record. Intervenors have failed to state any particularized significant impact potentially resulting from the requested license.

For all of the foregoing reasons, and as discussed at length below, Intervenors' request should be denied.

B. Legal Background

1. UMTRCA Regulations and Appendix A

To understand the import of Intervenors' arguments based on the NRC's mill tailings regulations and Appendix A, it is necessary to view them in the context of the Uranium Mill Tailings Radiation Control Act of 1978 ("UMTRCA"), Pub. Law No. 95-604 (codified in various sections of 42 U.S.C.), and its amendments, pursuant to which Appendix A and several of the regulations, including 10 C.F.R. § 40.31(h), were promulgated.

Congress enacted UMTRCA in 1978 to address concerns regarding the potential health and environmental hazards presented by uranium and thorium mill tailings. UMTRCA was based upon a finding that mill tailings located at active and inactive mill operations may pose a potential and significant radiation health hazard to the public. UMTRCA, Pub. L. No. 95-604, at 2(a), 92 Stat. 3021-22. In explaining the need for UMTRCA, the House Report, the only report accompanying the legislation, relied upon the description of the public health hazard of mill tailings in the testimony of then NRC Chairman, Dr. Joseph M. Hendrie:

> The NRC believes that long-term release from tailings piles may pose a radiation health hazard if the piles are not effectively stabilized to minimize radon releases and prevent unauthorized use of the tailings.
>
> * * *
>
> Unlike high-level radioactive waste from the back end of the nuclear fuel cycle, which contains products of the fission reaction, mill tailings contain only naturally occurring radioactive elements, in small quantities. The radioactive decay of these elements leads to production of radon, a radioactive gas with a half life of about four days, which can diffuse from a tailings pile into the atmosphere and subsequently expose persons to radiation far away from the pile. The increased exposure compared to exposure from radon already in the atmosphere from other sources is exceedingly slight, but this increase is in effect permanent. This is because radon production in mill tailings continues for times of the order of a hundred thousand years, so the tailings pile becomes a perpetual source injecting a small amount of radon into the atmosphere, unless some action is taken to keep the radon from escaping.
>
> The health effects of this radon production are tiny as applied to any one generation, but the sum of these exposures can be made large by counting far into the future, large enough in fact to be the dominant radiation exposure from the nuclear fuel cycle. Whether it is meaningful to attach significance to radiation exposures thousands of years in the future, or conversely, whether it is justifiable to ignore them, are questions without easy answers. The most satisfactory approach is to require every reasonable effort to dispose of tailings in a way that minimizes radon diffusion into the atmosphere.

H.R. Rep. No. 1480, 95th Cong., 2d Sess., pt. 2, at 25 (1978) (ellipsis in original).

There are two basic purposes of UMTRCA: (1) to provide a remedial action program at inactive mill tailings sites, Pub. L. No. 95-604, at 2(b)(1), 92 Stat. 3022, and (2) to provide a program for the regulation of "mill tailings during uranium or thorium ore processing at active mill operations and after termination of such operations." Id. at 2(b)(2), 92 Stat. 3022. Thus, Title I of UMTRCA provides a specific remedial program for a number of designated inactive and abandoned tailings sites under the primary direction of the Department of Energy. Id. at 101-115, 92 Stat. 3022-33. Title II establishes a comprehensive program for NRC regulation at active (licensed) mill tailings sites, by amending the Atomic Energy Act ("AEA") to include uranium and thorium mill tailings in the definition of byproduct material in section 11e.(2), and by adding sections 83, 84, and 275 and amending sections 161 and 274 of the AEA so as to provide the Commission with broad authority to manage all aspects of mill tailings sites. Id. at 201-206, 92 Stat. 3033-4. UMTRCA also directed EPA to promulgate "standards of general application" for both programs. Id. at 206, 92 Stat. 3040. Title II charged the NRC, however, with implementing and enforcing the EPA standards, in addition to establishing its own specific requirements and standards for carrying out the purposes of UMTRCA and conforming its regulations to the EPA general standards. Id. at 203, 205, 92 Stat. 3036, 3039.

As described in the House Report, the dual EPA and NRC standard-setting regime contemplated that:

> [t]he EPA standards and criteria should be developed to limit the exposure (or potential exposure) of the public and to protect the general environment from either radiological or nonradiological substances to acceptable levels through such means as allowable concentrations in air or water, quantities of the substances released over a period of time, or by specifying maximum allowable doses or levels to individuals in the general population.

H.R. Rep. No. 1480, supra note 196, pt. 1, at 16-17. The NRC, on the other hand:

> must set all standards and requirements relating to management concepts, specific technology, engineering methods, and procedures to be employed to achieve desired levels of control for limiting public exposure, and for protecting the general environment. The Commission's standards and requirements should be of such nature as to specify, for example, exclusion area restrictions on site boundaries, surveillance requirements, detailed engineering requirements, including lining for tailings ponds, depth, and types of tailings covers, population limitations or institutional arrangements such as financial surety requirements or site security measures.

Id. at 16.

As originally enacted, UMTRCA directed EPA to issue general standards for inactive sites and active sites. Pub. L. No. 95-604, at 206, 92 Stat. 3040. When EPA failed to promulgate its standards within the time set by Congress, the NRC published its "Uranium Mill Licensing Requirements," to meet its responsibilities under the Act. See 45 Fed. Reg. 65,521 (1980). The Commission's 1980 regulations were based upon the conclusions reached in NRC's Generic Environmental Impact Statement (GEIS) on uranium milling operations and management of mill tailings, NUREG-0706, "Final Generic Environmental Impact Statement on Uranium Milling" (Sept. 1980), and consisted of an introduction and 12 technical criteria to be codified as Appendix A to 10 C.F.R. Part 40. The regulations established a program to manage mill tailings by setting criteria for siting and disposing of mill tailings piles, controlling erosion and stabilizing tailings, limiting radioactive effluents from uranium and thorium mills and mill tailings, controlling seepage of toxic materials from tailings into groundwater, providing financial assurances for meeting disposal costs and long-term monitoring, and meeting the UMTRCA ownership requirements for tailings and disposal sites.

After the Commission issued its 1980 mill tailings regulations, Congress amended UMTRCA. Act of Jan. 4, 1983, Pub. L. No. 97-415, §§ 18-22, 96 Stat. 2067, 2077-80 (1983) (codified in various sections of 42 U.S.C.). The amendments set new deadlines for EPA to issue

general standards. Pub. L. No. 97-415, § 18(a), 96 Stat. 2077. Congress also amended UMTRCA to clarify that EPA, in promulgating general standards, and the NRC, in issuing mill tailings regulations, should consider, in addition to the risk to the public health, safety, and environment, the economic costs of regulation, as well as such additional factors as the agencies consider appropriate. Id. at 22, 96 Stat. 2080. Thus, Congress added the language cited below to the end of section 84(a)(1) of the AEA (which had been added originally by UMTRCA):

> The Commission shall insure that the management of any byproduct material, as defined in section [11e.(2)], is carried out in such manner as --
>
> (1) the Commission deems appropriate to protect the public health and safety and the environment from radiological and non-radiological hazards associated with the processing and with the possession and transfer of such material, taking into account the risk to the public health, safety, and the environment, with due consideration of the economic costs and such other factors as the Commission determines to be appropriate.

42 U.S.C. § 2114(a)(1).

Congress also added flexibility to the AEA in section 84(c), permitting licensees to propose alternatives to the Commission's Part 40 and Appendix A requirements:

> In the case of sites at which ores are processed primarily for their source material content or which are used for the disposal of byproduct material as defined in section [11e.(2)], a licensee may propose alternatives to specific requirements adopted and enforced by the Commission under this [Act]. Such alternative proposals may take into account local or regional conditions, including geology, topography, hydrology and meteorology. The Commission may treat such alternatives as satisfying Commission requirements if the Commission determines that such alternatives will achieve a level of stabilization and containment of the sites concerned, and a level of protection for public health, safety, and the environment from radiological and nonradiological hazards associated with such sites, which is equivalent to, to the extent practicable, or more stringent than the level which would be achieved by standards and requirements adopted and enforced by the Commission for the same purpose and any final standards

> promulgated by the Administrator of the Environmental Protection Agency in accordance with section.

42 U.S.C. § 2114(c).

Immediately after Congress enacted the amendments to UMTRCA in 1983, EPA issued its general standards for inactive sites. 48 Fed. Reg. 590 (1983) (codified at 40 C.F.R. §§ 192.00-.23). Later that year, EPA published its general standards for active sites, which, with the exception of those for groundwater, were essentially identical to its inactive site standards. 48 Fed. Reg. 45,926 (1983) (codified at 40 C.F.R. §§ 192.30-192.43). Among other things, the EPA standards established radon emission limits for disposal areas and provided that such areas must assure control of radiological hazards "for one thousand years, to the extent reasonably achievable, and, in any case, for at least 200 years." 40 C.F.R. § 192.32(b)(1)(i).

With one exception, EPA's inactive site standards were upheld against numerous challenges from industry and environmental petitioners. See American Mining Congress v. Thomas, 772 F.2d 617 (10th Cir. 1985), cert. denied, 476 U.S. 1158 (1986) ("AMC I") (court invalidated portion of the EPA standard directing that groundwater contamination should be dealt with on a by-site basis). EPA's active site standards also were upheld against numerous challenges by industry and environmental petitioners. See American Mining Congress v. Thomas, 772 F.2d 640 (10th Cir. 1985), cert. denied, 476 U.S. 1158 (1986).

Subsequent to the issuance of EPA's general standards for active sites, the Commission undertook rulemaking proceedings to bring its 1980 mill tailings regulations into conformity with the EPA standards. See 49 Fed. Reg. 46,418 (1984) (codified at 10 C.F.R. Part 40, Appendix A) (proposed Nov. 28, 1984). Those proceedings culminated in the promulgation of the Commission's 1985 regulations, amending the earlier 1980 requirements. 50 Fed. Reg. 41,852 (1985). Many of the 1985 criteria, again appearing as Appendix A to

10 C.F.R. Part 40, were unchanged from the 1980 version. The Commission changed some criteria to conform to the EPA standards and essentially duplicated them. For example, Criterion 6 was amended to adopt both EPA's radon emission limits for disposal areas and its longevity standard, requiring waste areas to be designed to control radiological hazards "for 1,000 years, to the exten[t] reasonably achievable, and, in any case, for at least 200 years." 10 C.F.R. Part 40, Appendix A, Criterion 6; see 50 Fed. Reg. at 41,857-58. The criteria that remained essentially identical to the Commission's 1980 regulations were Criteria 2, 3, 4, 7, 8A, and portions of each of the others. See Quivira Mining Co. v. NRC, 866 F.2d 1246, 1252-58 (10th Cir. 1989). The 1985 criteria that the Commission revised to conform to EPA's general standards were parts of the Introduction, Criteria 1, 5, 6, and 8. Id.

With respect to the Introduction, the first three paragraphs of the Introduction to Appendix A remained essentially unchanged from 1980. The Commission, however, added a new fourth paragraph in the 1985 regulations to implement one of the 1983 amendments to UMTRCA. As previously noted, that amendment added section 84c to the AEA in order to provide site-specific flexibility in licensing by permitting licensees to propose alternatives to Commission mill tailings requirements. The new fourth paragraph of the Introduction is virtually identical to the statute and states:

> Licensees or applicants may propose alternatives to the specific requirements in this Appendix. The alternative proposals may take into account local or regional conditions, including geology, topography, hydrology, and meteorology . . ..

10 C.F.R. Part 40, Appendix A, Introduction; see 50 Fed. Reg. at 41,856.

The 1985 regulations also added a fifth paragraph to the Introduction, reiterating the 1983 amendment to UMTRCA and the AEA that was intended to clarify the factors the NRC should

consider in regulating mill tailings. The new fifth paragraph to the Appendix A Introduction paraphrases the UMTRCA amendment:

> All site specific licensing decisions based on the criteria in this Appendix or alternatives proposed by licensees or applicants will take into account the risk to the public health and safety and the environment with due consideration to the economic costs involved and any other factors the Commission determines to be appropriate. In implementing this Appendix, the Commission will consider "practicable" and "reasonably achievable" as equivalent terms. Decisions involved [sic] these terms will take into account the state of technology, and the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to the utilization of atomic energy in the public interest.

10 C.F.R. Part 40, Appendix A, Introduction; see 50 Fed. Reg. at 41,855.

Acknowledging that site-specific factors may dictate precise means of compliance at any particular site, Part 40 of the regulations and the compliance criteria in Appendix A created performance-directed objectives emphasizing flexibility, rather than prescriptive prerequisites to licensing. Thus, the statute and the implementing regulations clearly recognize and make allowance for the fact that mill tailings management, and to a greater extent, ISL mining, are relatively low-risk activities requiring regulatory flexibility to account for the unique circumstances posed by the natural systems in which these activities take place.

2. NEPA and 10 C.F.R. Part 51

Because Intervenors also raise claims based on the requirements of the National Environmental Policy Act of 1969 ("NEPA" or "the Act"), 42 U.S.C. §§ 4321, et seq., a brief review of the Act and NRC's implementing regulations is helpful in analyzing these claims.

The Council on Environmental Quality's ("CEQ") regulations state, "[NEPA] is our basic national charter for protection of the environment." 40 C.F.R. § 1500.1.[20] Section 101 of NEPA "declares a broad national commitment to protecting and promoting environmental quality," see Robertson v. Methow Valley Citizens Council, 490 U.S. 519, 558 (1978), and sets forth the Act's basic "substantive goals for the Nation," Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 558 (1978), that the federal government should "use all practicable means and measures" to protect environmental values." 42 U.S.C. § 4331(a) Section 101(b) of the Act provides that "it is the continuing responsibility of the federal government to use all practicable means, consistent with other essential considerations of national policy" to, inter alia, avoid environmental degradation, "attain the widest range of beneficial uses of the environment without degradation . . . or other undesirable and unintended consequences," and "preserve important historic, cultural, and natural aspects of our national heritage." 42 U.S.C. § 4331(b).

To meet the goals set forth in section 101, section 102 of the Act includes "action-forcing" procedures. See Calvert Cliffs' Coordinating Committee v. AEC, 449 F. 2d 1109, 1113 and n. 7 (D.C. Cir. 1971). Section 102 mandates that "to the fullest extent possible" all federal agencies shall "utilize a systematic, interdisciplinary approach . . .in planning and in decision making which may have an impact on man's environment." 42 U.S.C. § 4332(2)(A). Section 102 requires that environmental considerations are a part of agency decision making by instructing agencies to "identify and develop methods and procedures . . . which will ensure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations." 42 U.S.C. § 4332(2)(B).

[20] We note here that, as a matter of law, the NRC as an independent regulatory agency can be bound by CEQ's NEPA regulations only insofar as those regulations are procedural or ministerial in nature. NRC is not,

Pursuant to section 102(2)(C) of NEPA and the NRC regulations implementing the Act, the NRC Staff must prepare an environmental impact statement ("EIS") addressing any major action taken by the Commission that may significantly affect the quality of the human environment. 42 U.S.C. § 4332(2)(C); 10 C.F.R. Part 51. The Commission's regulations in 10 C.F.R. Part 51 implement NEPA "in connection with the Commission's licensing and regulatory activities." 10 C.F.R. § 51.1(b). The regulations state that the "principal objective of [NEPA] is to build into the agency decision making process an appropriate and careful consideration of environmental aspects of proposed actions." 10 C.F.R. § 51.1(a). Moreover, the regulations specify "types of actions that require either an environmental impact statement, a negative declaration supported by an environmental impact appraisal, or no environmental analysis at all." See In the Matters of Duke Power Company, 12 NRC 459, 1980 NRC LEXIS 24, *21 (1980), citing, 10 C.F.R. § 51.5. Neither NEPA nor the NRC regulations require the Staff to prepare an EIS if the federal action's effect on the environment is not "significant."[21] See In the Matter of Curators of the University of Missouri, 1995 NRC LEXIS at *110. If, however, the proposed action has a significant affect, then there must be a "detailed statement by the responsible party on –

> (i) the environmental impact of the proposed action,
> (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
> (iii) alternatives to the proposed action,
> (iv) the relationship between local short term uses of man's environment and the maintenance and enhancement of long term productivity, and

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therefore, bound by those provisions of CEQ's regulations which have a substantive impact on the manner in which the Commission performs its regulatory functions. See 49 Fed Reg. 9352 (1984).

[21] ENDAUM and SRIC appear confused about the requirements of NEPA. On page 39 of their brief, they state: "[a]n environmental impact statement (EIS) must be prepared by the agency which is a detailed statement of the environmental effects of the proposed action . . .. 42 U.S.C. § 4332(2)(C)." (emphasis added). NEPA only requires the preparation of an EIS where the major federal action's effect on the environment is "significant." See In the Matter of Curators of the University of Missouri, 1995 NRC LEXIS at *110.

> (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

42 U.S.C. § 4322(2)(C). If a "detailed statement" setting forth this information is required, NRC's regulations provide that the NRC Staff must prepare and circulate a draft environmental impact statement ("DEIS"), followed by the publication of a final environmental impact statement ("FEIS"). See 10 C.F.R. §§ 51.70 - 51.73, 51.80 - 51.81 (incorporating 51.74), and 51.97; see also In the Matters of Duke Power Company 1980 NRC LEXIS at *22.

When issuing a source material license pursuant to the Commission's regulations set forth at 10 C.F.R. Part 40, Part 51 and NEPA requirements must be satisfied. See 10 CFR § 51.21(b)(8). Part 51 has been incorporated into 10 C.F.R. § 40.32 of the Commission's regulations which states that an "application for a specific license will be granted if . . . :

> (e) In the case of an application . . . for a license to possess and use source and byproduct material for uranium milling, . . . the Director of Nuclear Material Safety and safeguards or his designee, before commencement of construction of the plant or facility in which the activity will be conducted, on the basis of information filed and evaluations made pursuant to subpart A of part 51 of this chapter, has concluded, after weighing the environmental, economic, technical and other benefits against the environmental costs and considering available alternatives, that the action called for is the issuance of the proposed license, with any appropriate conditions to protect environmental values.

10 C.F.R. § 40.32 (emphasis added). Thus, in order to issue a source material license, the NRC Staff must weigh the environmental, economic, technical and other benefits of issuing the license against the environmental costs and consider available alternatives based on information and evaluations made pursuant to subpart A of Part 51. The Staff may issue the license "with any appropriate conditions to protect environmental values." Id. The Staff's determinations with

respect to environmental concerns are based in part upon an environmental report ("ER") which must be prepared by applicants for materials licenses.[22] 10 C.F.R. § 51.60.

Once a materials license is issued, the adequacy of the Staff's environmental review can be challenged in a hearing. See Limerick Ecology Action, Inc. v. NRC, 869 F.2d 719, 729-730 (3d Cir. 1989). Because the Staff ultimately is responsible for preparing the EIS required by NEPA, see sections 51.80 ("NRC Staff will . . . prepare a draft environmental impact statement") and 51.97 (Staff must prepare final environmental impact statement), the Staff generally has the burden on contentions, or those portions of contentions, that allege deficiencies in the EIS. See In the Matter of Louisiana Energy Services, 44 NRC 331, 1996 NRC LEXIS 61, * 15 (1996), citing, Duke Power Co. 17 NRC 1041, 1049 (1983) (Staff has the burden of complying with NEPA). However, "because the Staff, as a practical matter relied heavily upon the [a]pplicant's ER in preparing the EIS, should the [a]pplicant become a proponent of a particular challenged position set forth in the EIS, the [a]pplicant, as such a proponent, also has the burden on that matter." Id., citing, Public Service Co. of New Hampshire, 7 NRC 477, 489 n. 8 (1978).

Similarly, because, as described above, the Commission's regulations require the applicant for a materials license to file an ER, 10 C.F.R. § 51.60, and prescribe its contents, 10 C.F.R. § 51.45, the applicant has the burden on contentions, or those portions of contentions,

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[22] Section 51.60 ("Environmental report – materials license") states:

> (a) Each applicant for a license or other form of permission, or an amendment to or renewal of a license or other form of permission issued pursuant to part[] . . . 40 . . . of this chapter, and covered by paragraphs (b)(1) through (b)(5) of this section, shall submit with its application to the Director of Nuclear Material Safety and Safeguards . . . a separate document, entitled "Applicant's Environmental Report." The "Applicant's Environmental Report shall contain the information specified in § 51.45 . . ..
> (b) As required by paragraph (a) of this section, each applicant shall prepare an environmental report for the following types of actions:
>
> (ii) Possession and use of source material for uranium milling or production of uranium hexafluoride pursuant to part 40 of this chapter.

10 C.F.R. § 51.60.

asserting deficiencies in the ER. See In the Matter of Louisiana Energy Services, 1996 NRC LEXIS at 15; Consumers Power Co., 7 AEC 19, 31 (1974).

II. STANDARD OF REVIEW

Before turning to the merits of Intervenors' complaints, it is necessary to recognize the appropriate standard of review. The Commission's regulations require the Staff to make a number of findings concerning the applicant and its ability to protect the public health and safety before issuing a materials license. Philadelphia Electric Co. (Limerick Generating Station, Units 1 and 2), ALAB-778, 20 NRC 42, 48 (1984); see 10 C.F.R. § 70.23, 70.31; cf. South Carolina Electric and Gas Co. (Virgil C. Summer Nuclear Station, Unit 1), ALAB-642, 13 NRC 881, 895-96 (1981), aff'd sub nom.; Fairfield United Action v. NRC, 679 F.2d 261 (D.C. Cir. 1982). Specifically, 10 C.F.R. § 40.32 states:

> An application for a specific license will be approved if:
>
> (a) The application is for a purpose authorized by the Act; and
>
> (b) The applicant is qualified by reason of training and experience to use the source material for the purpose requested in such a manner as to protect health and minimize danger to life or property; and
>
> (c) The applicant's proposed equipment, facilities and procedures are adequate to protect health and minimize danger to life or property; and
>
> (d) The issuance of the license will not be inimical to the common defense and security or to the health and safety of the public; and
>
> (e) In the case of an application . . . for a license to possess and use source and byproduct material for uranium milling, . . . the Director of Nuclear Material Safety and safeguards or his designee . . . has concluded, after weighing the environmental, economic, technical and other benefits against the environmental costs and considering available alternatives, that the action called for is the issuance of the proposed license . . ..

10 C.F.R. § 40.32 (emphasis added). Thus, for the Commission to grant a materials license or license amendment, it must find that (1) the applicant's proposed equipment and facilities are adequate to protect health and minimize danger to life or property; and (2) the applicant is qualified by training and experience to use the material for the purpose requested in such a manner as to protect public health and minimize danger to life or property and to comply with the Commission's regulations. See In the Matter of the Curators of the University of Missouri, 41 NRC 71, 1995 NRC LEXIS 21, *43 (1995). A license or amendment is not to be denied simply on the basis of a deficiency or omission in the application. Id. The Staff, in its review of a license application, is not required to make specific findings of fact or to explain its approval of a license. Id. at *106. Although such findings and explanations may be helpful in later proceedings to a Presiding Officer or a party challenging the license, they are not required under NRC orders, policy statements, and regulations. Id.

When a license or amendment is challenged, the licensee generally bears the ultimate burden of proof. 10 C.F.R. §§ 2.732, 2.1237(b); see also, Metropolitan Edison Co. 16 NRC 1265, 1271 (1982). Those challenging a license, however, must provide some basis for further inquiry. Metropolitan Edison Co., 16 NRC at 1271. Where one of the parties challenging the license contends that, for a specific reason the permit or license should be denied, that party has the burden of going forward with evidence to buttress that contention. Once the party has introduced sufficient evidence to establish a prima facie case, the burden then shifts to the applicant, which as part of its overall burden of proof, must provide a sufficient rebuttal to satisfy the Board that it should reject the contention as a basis for denial of the permit or license. Louisiana Power and Light Co. 17 NRC 1076, 1093 (1983), citing, Consumers Power Co. 6 AEC 331, 345 (1973); General Public Utilities Nuclear Corp. 31 NRC 1, 15-16 (1990).

When reviewing a decision of the Staff to issue a materials license, the Presiding Officer is required to review de novo all issues sufficiently established by Intervenors. As the people responsible for drafting and interpreting the rules, and having been delegated authority to make final licensing determinations, NRC staff evaluation of a license application should be accorded deference. Because the licensee bears the burden of proof, however, the adequacy of the Staff's safety review is not determinative of whether the application should be approved. See In the Matter of the Curators of the University of Missouri, 1995 NRC LEXIS at *104-6 (1995) (citations omitted). Even if a Presiding Officer or Board determines that the NRC Staff failed to conduct a sufficient review, to deny a meritorious application for a license based on the Staff's error would be "grossly unfair." Id. at *106. Thus, the "sole focus of the hearing is on whether the application satisfies NRC regulatory requirements, rather than the adequacy of the NRC Staff performance." Id. at *105.

III. ARGUMENT

A. HRI's License Application is Adequate to Protect Public Health and Safety and Meets the Regulatory Requirements for the Protection of Surrounding Soils, Surface, and Groundwater from HRI's Liquid Waste

1. HRI Need Not Specify the Method of Disposal to Receive an NRC Materials License

The gravamen of Intervenors' initial complaint is that HRI failed to specify which of the four liquid waste disposal methods: evaporation ponds, land application, surface water discharge, and deep well injection, it will use at Church Rock Section 8. Intervenors allege that HRI's application thus is in violation of 10 C.F.R. § 40.31(h) and 10 C.F.R. Part 40, Appendix A. Intervenors' reliance on 10 C.F.R. § 40.31(h) is misplaced. Moreover, Intervenors fail to recognize that the criteria in Appendix A are to be applied with flexibility to achieve an optimum

management and disposal program on a site-specific basis and that different issues are presented by process versus restoration liquids and residuals.

a. 10 C.F.R. Section 40.31(h) Does Not Apply to ISL Mining

Throughout their brief, ENDAUM and SRIC argue that HRI has failed to provide adequate written specifications relating to operations and disposal at Church Rock Section 8, in violation of 10 C.F.R. § 40.31(h). For example, on pages 11-18 of their brief, ENDAUM and SRIC assert that HRI's application fails to meet 10 C.F.R. § 40.31(h) because: (1) HRI has not identified which of the four liquid waste disposal systems it will use at Church Rock Section 8 or provide specifications demonstrating that Appendix A criteria are met, and (2) HRI's application provides insufficient specifications to demonstrate clearly how the requirements of Appendix A will be satisfied with respect to retention ponds and evaporation ponds. ENDAUM and SRIC Phase I Brief at 11-18.

ENDAUM and SRIC ignore the plain language of section 40.31(h). The regulation states:

> An application for a license to receive, possess, and use source material for uranium or thorium milling or byproduct material, as defined in this part, at sites formerly associated with such milling shall contain proposed written specifications relating to milling operations and the disposition of the byproduct material to achieve the requirements and objectives set forth in appendix A of this part. Each applicant must clearly demonstrate how the requirements and objectives set forth in appendix A of this part have been addressed. Failure to clearly demonstrate how the requirements and objectives in appendix A have been addressed shall be grounds for refusing to accept the application.

10 C.F.R. § 40.31(h) (emphasis added).[23] Thus, section 40.31(h) applies only to those sites "formerly associated with" the milling of source material for uranium or thorium.[24] As Church

[23] ENDAUM and SRIC fail to cite the entire regulation in their brief, thus ignoring the language relating to sites formerly associated with milling.

Rock Section 8 is not a site "formerly associated with" milling source material for uranium or thorium, section 40.31(h) does not apply to HRI's license application.

b. HRI Has Provided Adequate Information Regarding Wastewater Management Issues to Satisfy Requirements of Appendix A

In any event, Intervenors' arguments that HRI's failure to specify which of four disposal options it will employ violates Appendix A and that HRI has not specified how management systems are "developed considering the expected full capacity of tailings or waste systems and the lifetime of mill operations" are wanting.

Intervenors have adopted an overly restrictive interpretation of the relevant Appendix A criteria, overlooking the fact that, as stated above, the Appendix A criteria were intended primarily to serve as flexible performance objectives for assuring safe disposal of byproduct materials from milling operations (and, to the extent relevant, to ISL operations) that can be tailored to site-specific conditions. The Introduction to Appendix A expressly states that "flexibility is provided in the criteria to allow achieving an optimum tailings disposal program on a site-specific basis." 10 C.F.R. Part 40, Appendix A, Introduction. In addition, in the preamble to the original 1980 Appendix A, NRC stated:

> The NRC has developed regulations mindful of the need to avoid being overly restrictive. The NRC's experiences over the past several years, working with interim tailings management performance objectives similar in nature to the criteria contained in the following rules, has been that the industry can develop many innovative ways of achieving broad goals. Also, the NRC recognizes . . . that the problem of tailings management is highly site specific. The precise details of a program can be worked out only when unique conditions of a site are known. . . . The rules

[24] In support of this interpretation, section 40.31(h) was promulgated in 1980 in response to the enactment of UMTRCA.

have been developed with flexibility to reflect this fact.[25]

As noted, NRC's Final GEIS on uranium milling, see supra at 12, assessed the potential environmental impacts of uranium milling operations, including ISL surface waste management, and provides the basic underpinnings for the Appendix A criteria. The basic conclusions reached in the final GEIS were incorporated into the Appendix A criteria. In that document, NRC responded to a comment about the performance objective, versus prescriptive requirement, bases of its proposed criteria for the management of uranium and thorium recovery operations, including final disposal, byproduct material disposal by commenting that:

> The staff acknowledges that it has not been able to be numerically definitive in a number of instances. This is primarily due to the intensely site-specific nature of the problems addressed. The staff has concluded that regulatory guides better serve the purpose of exemplifying acceptable methods of achieving the criteria contained in the revised regulations. The staff's final regulations largely specify performance objectives, against which proposals will be judged in the case-by-case reviews required

[25] 45 Fed. Reg. 65521, 65523-65524 (Oct. 3, 1980) (emphasis added). Subsequently, in incorporating the EPA groundwater protection requirements found in 40 C.F.R. Part 192 into the Appendix A criteria, NRC again emphasized the flexibility of the Appendix A criteria. It noted:

> The differences between the conformed NRC regulations and the EPA SWDA standards would primarily be in the level of detail and specificity or in aspects that are not necessarily needed for mill tailings management. Experience from site specific implementation can be used to identify areas where clarification or additional details might be needed in NRC's regulations or guidance documents.
>
> The mandate in section 84(a)(3) of the AEA requires NRC to assure that byproduct material is managed in a manner that "conforms to general requirements established by the Commission . . . .The Commission believes that the combination of conformed regulations, policy and guidance, and license conditions can adequately meet this mandate for the foreseeable future.
>
> * * *
>
> In deciding the precise language to incorporate, the Commission generally had the following objectives. . . .
>
> > 3. Provide maximum flexibility to implement the standards in guidance and site specific licensing decision[s].

51 Fed. Reg. 24697, 24701 (July 6, 1986) (emphasis added).

> under the UMTRCA [Uranium Mill Tailings Radiation Control Act]. . ..[26]

Consistent with this approach and pursuant to a public comment, NRC also replaced the word "requirements" used in the Introduction section of Appendix A with the word "criteria."[27] Given the flexibility inherent in the Appendix A criteria, HRI is not required to provide in its license application minute details sought by Intervenors.

Finally, the basis for NRC's approach to regulation of ISL mining under relevant Appendix A criteria is based on the fact that, like tailings ponds/piles, ISL mining operations involve "natural systems" that are highly dependent upon site specific factors. Where mines are expanded because new ore resources are discovered or market conditions change largely dictate the direction and scope of future expansions and thus the location of new retention ponds, something that cannot be spelled out in HRI's license application. In other words, as a practical matter, HRI cannot provide details about every aspect of the construction and operation of retention ponds in its license application as Intervenors demand because the specifics will be determined in the course of actual operations. For example, if the wastes generated by the ISL process were high volume solids, like mill tailings, a specific disposal plan might be appropriate. However, unlike tailings, the ISL process does not create a mountain of solid waste, but rather involves processing and managing a significant volume of liquids and managing a small amount of residues. These liquids must be managed so that at the end of the project the site can be released for unrestricted use, and the residues from production operation must be sent to an off-site uranium mill tailings disposal facility as 11e.(2) byproduct material pursuant to 10 C.F.R.

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[26] NUREG 706, U.S. Nuclear Regulatory Commission, "Final Generic Environmental Impact Statement On Uranium Milling," Vol. II, Appendix A, A-83 (Sept. 1980) (emphasis added).

[27] Id. at A-82.

Part 40, Appendix A, Criterion 2. Mill tailings, in contrast, cannot be released for unrestricted use but rather, must be transferred in fee to a state with appropriate jurisdiction or the Department of Energy ("DOE") for holding in perpetuity. Thus, there is a fundamental distinction between management and disposal of uranium mill tailings as opposed to the management of process and restoration water and residues therefrom. The latter are actively managed during operations and restoration but have no long term (i.e., 200-1,000 year) disposal requirements. Thus, the concerns about potential impacts from retention ponds at ISL facilities are not even remotely of the same magnitude as those associated with mill tailings. Accordingly, the level of detail in the information required for NRC's uranium recovery staff to assess the impacts of ISL mining wastes is of a much lower magnitude than that required for mill tailings or reactors.

2. HRI's Application Complies With Applicable Requirements of 10 C.F.R. Part 40, Appendix A, Criterion 5 (Surface Impoundment Requirements).

a. HRI's Application Satisfies the Requirements of Criterion 5A(1).

On page 18 of their brief, ENDAUM and SRIC assert that HRI's application "does not contain specifications necessary to demonstrate its ponds will prevent migration of wastes." ENDAUM and SRIC Phase I Brief at 18. Specifically, they argue that HRI's failure to provide sufficient information on liner design, size, construction, or installation and removal during remediation, violates 10 C.F.R. Part 40, Appendix A, Criterion 5A(1). Id. at 18-19. Criterion 5A states in relevant part:

> [S]urface impoundments (except for an existing portion) must have a liner that is designed, constructed, and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil, groundwater, or surface water at any time during the active life (including the closure period) of the impoundment. The liner may be constructed of materials that may allow wastes to migrate into the liner (but not into the adjacent subsurface soil, ground water or surface water) during the active life of the facility,

> provided that impoundment closure includes removal or decontamination of all waste residues, contaminated containment system components (liners, etc.), contaminated subsoil, and structures and equipment contaminated with waste and leachate.

10 C.F.R. Part 40, Appendix A, Criterion 5A(1). Thus, Criterion 5A requires that surface impoundments have a liner that prevents migration of waste outside of the impoundment. In accordance with this requirement, HRI stated in COP 2.0 that:

> "all CUP surface impoundments will be equipped with two impermeable synthetic membrane liners: an inner 30 mil Hypalon liner, or equivalent, and an outer liner 36 mils thick made of Hypalon, or equivalent (1 mil=0.001 inch). A space 4 to 5 inches thick between the two liners will contain sand, or some other (granular) porous medium, and a drainage network of open piping, forming an underdrain leak detection system. The (inner) liner will provide secondary containment for any leakage that may occur."

See COP 2.0. NRC recognized HRI's commitment in this regard in the SER:

> HRI has committed to using a double-lined, impermeable synthetic membrane for its waste retention ponds in accordance with 10 C.F.R. Part 40, Appendix A requirements. The liners will be separated by 4-5 inches of sand or equivalent medium, and a drainage network of open piping which forms an underdrain leak detection system. The inner liner will provide secondary containment for any leakage that may occur. HRI states that it will conduct daily inspections for leakage, and that fluid found in the leak detection system will be cause for immediate corrective action, including notification of the NRC.

SER at 30. Thus, as the NRC Staff recognized in the SER, HRI provided specific information on liner design, size and construction. With respect to the removal and remediation of the liners, unlike a clay liner, the synthetic liners will simply be removed and disposed of offsite as indicated in the COP. See COP at § 10.3.2 at 159.[28]

[28] We note that HRI's license contains a condition that prior to injecting lixiviant at a site, HRI must provide NRC "information, calculations, and analyses documenting the adequacy of the design of the waste retention ponds, and their associated embankments (if applicable), liners, and hydrologic site characteristics." See License Condition 10.26; see also SER at 27 (emphasis added).

b. HRI's Application Satisfies the Requirements of Criterion 5A(2).

In addition to the argument set forth above, ENDAUM and SRIC argue that "HRI's application does not contain any of the information required by Criterion 5A(2)." ENDAUM and SRIC Phase I Brief at 20. Criterion 5A(2) requires that the surface impoundment liner be: (a) "constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure . . ."; (b) placed on a foundation or base capable of providing support to the liner . . ."; and, (c) installed to cover all surrounding earth likely to be in contact with the wastes or leachate." 10 C.F.R. Part 40, Appendix A, Criterion 5A(2). As stated above, HRI provided specific data regarding the thickness, strength and chemical properties of the liner it intends to use in support of its application in the COP: surface impoundments will be equipped with two impermeable synthetic membrane liners, an inner 30 mil Hypalon liner (a high-density polyethylene liner), or equivalent, and an outer liner 36 mils thick made of Hypalon, or equivalent (1 mil=0.001 inch). See COP 2.0. In fact, HRI states that in all cases, the pond liners will be rated to withstand ambient temperatures and pressures of their environment, using published, generally accepted ratings. Liners will be chemically resistant, over their useful life, to the fluids and solids with which they are in contact in accordance with Criterion 5A(2)(a).

Moreover, HRI provided two schematics of the waste pond design that will be universally employed at all HRI locations showing that ponds will be lined with two layers of synthetic material, with a leak detection system in place between the two liners. See HRI, Inc. Churchrock Revised Environmental Report, Figures 3.2-3 and 3.2-4 (March 16, 1993)("1993 Churchrock ER").

On page 19 of their brief, ENDAUM and SRIC claim that HRI proposes no liner specifics for "evaporation ponds." ENDAUM and SRIC Phase I Brief at 19. HRI does not distinguish

between pond types (i.e., "retention ponds" and "evaporation ponds")[29] and all ponds will be constructed with the same liner specifications described above.

With regard to the base upon which the liner will be placed and the coverage of the liner, HRI has committed to, and must in accordance with License Condition 10.26, follow design criteria enumerated in Regulatory Guide 3.11, "Design, Construction, and Inspection of Embankment Retention Systems for Uranium Mills" WM-8201, "Hydrologic Design Criteria for Tailings Retention Systems," and Final Staff Technical Position (FSTP), "Design of Erosion Protection Covers for Stabilization of Uranium Mill Tailings Sites," when constructing waste retention ponds. See SER at 31. In addition, HRI's schematics discussed above show that the liners will cover the entire pond area and be "keyed" to the embankment at the top of the slope. See 1993 Churchrock ER at Figures 3.2-3 and 3.2-4.

c. HRI's Application Satisfies the Requirements of Criterion 5A(4).

On pages 20-21 of their brief, ENDAUM and SRIC claim that HRI's application fails to discuss overtopping in adequate detail, to show how overtopping will be prevented, and to analyze the impacts of operations, overfilling, wind and wave actions, rainfall, etc., in violation of Criterion 5A(4). ENDAUM and SRIC Phase I Brief at 20-21. Specifically, ENDAUM and SRIC complain that HRI does not identify the Probable Maximum Precipitation ("PMP") or the Probable Maximum Flood ("PMF") at the Chruchrock site. Id.

Criterion 5A(4) states:

> [a] surface impoundment must be designed, constructed, maintained, and operated to prevent overtopping resulting from normal or abnormal operations, overfilling, wind and wave actions, rainfall, or run-on; from malfunctions of level controllers, alarms, and other equipment; and from human error.

[29] Evaporation ponds are merely a type of retention pond.

10 C.F.R. Part 40, Appendix A, Criterion 5A(4). In accordance with Criterion 5A(4), HRI provided various documents to NRC Staff pertaining to overtopping. Specifically, HRI has performed flood and run on analyses at each CUP location addressing the effects of flood events such as PMF and PMP on overtopping. See Espey, Huston and Associates, Inc. (1993, 1996a and 1996b)(Hearing Record ACN 9304130415). As reflected in the SER, HRI provided PMF analyses, including peak flow rates, times of concentration, drainage areas, rainfall distributions, and infiltration losses, based on models recommended by the NRC Staff in the FSTP. See SER at 28. These analyses provided the basis for the stated plans within the COP Rev. 2.0[30] and the conclusion that the proposed pond locations will result in flood estimates that are considered to be acceptable for design purposes. Id. Based on the analyses, and as reflected in the SER, run-on is a consideration that will be included in the final project design but does not pose a significant design obstacle. See SER at 28-29. Most importantly, License Condition 10.26 requires that before injecting lixiviant at the Churchrock site, HRI must provide NRC Staff analyses and calculations for "peak flood flows, including PMF, and documenting the methods and assumptions used to compute the floods" and "water surface profiles and velocities associated with the ability of the retention ponds or diversion channels to resist erosion or flooding." License Condition 10.26.

Intervenors' other overtopping concerns pertain to rainfall, wind and wave action, and operator error. It is difficult to imagine how maximum rains in McKinley County, New Mexico could result in overtopping as the Probable Maximum Precipitation (PMP) is 8.9 inches. In any event, in accordance with License Condition 10.26(d), prior to injecting lixiviant at Churchrock, HRI must establish an adequate freeboard to contain the PMP. Wind and wave action are not factors in small impoundments because License Condition 10.26 requires HRI to comply with

[30] COP Rev. 2.0 at 29-35.

NRC guidance which sets requirements with respect to these factors. Intervenors also cast concern that operator error may cause overfilling of the ponds. HRI will conduct operations so that pond freeboard is maintained and will do so through proper Standard Operating Procedures (SOPs) as stated in the COP Rev. 2 § 9.16 and as required by License Condition 9.8. COP Rev. 2 § 9.16 at 153-154; License Condition 9.8.

Similar to the arguments stated above, Intervenors state that HRI failed to provide sufficient analysis of arroyo flooding resulting from site drainage. HRI presented analysis of retention pond design features in the COP. See COP Rev. 2.0. A summary of the potential for arroyo flooding is discussed for each site. Id. Arroyo flooding has been analyzed by Espey, Huston and Associates and certified by a registered professional engineer. The results of the engineering analysis show that construction of the impoundments at Section 8 will have no impact on the arroyo and that the arroyo should not be subject to inundation or erosion from the 25- or 100-year frequency storms. See Espey, Huston & Assoc., Inc., Surface Water Drainage Analysis for Proposed HRI, Inc. Churchrock In-Situ Uranium Leach Project, McKinley County, New Mexico at 9 (August 1993)(ACN No. 9312140053). Moreover, as pointed out in the SER, HRI will need to construct certain design features that will safely store or discharge run-off from large storm events to prevent such flooding. SER at 27.

d. HRI's Application Satisfies the Requirements of Criterion 5A(5).

On page 22 of ENDAUM's and SRIC's brief, and on page 7 of Morris and Sam Brief, Intervenors claim that HRI does not meet Criterion 5(A)(5) design standards for dikes. ENDAUM and SRIC Phase I Brief at 22; Morris and Sam Phase I Brief at 7. Criterion 5(A)(5) states that:

> [w]hen dikes are used to form the surface impoundment, the dikes must be designed, constructed, and maintained, with sufficient, structural integrity to prevent massive failure of the dikes. In ensuring structural integrity, it must not be presumed that the liner system will function without leakage during the active life of the impoundment.

10 C.F.R. Part 40, Appendix A, Criteria 5A(5). HRI has committed to satisfy the criteria for choosing below ground level design and to the specifications stated in NRC Regulatory Guide 3.11, "Design, Construction, and Inspection of Embankment Retention Systems for Uranium Mills" for any dikes employed. SER at 29. At Churchrock Section 8, the area where the ponds will be developed is flat; accordingly, below ground level design is anticipated. See 1993 Churchrock ER, Figure 3.2-1. Intervenors also state that HRI cannot presume that the liner will not leak. HRI has not presumed that the liner will not leak. As stated above, all ponds will be equipped with a second liner and leak detection system, to safeguard against leaks in the exposed liner. See COP at 29; SER at 29; License Condition 10.26.

3. Criteria 7 and 7A Do Not Apply to HRI's License Application.

Intervenors complain that HRI's license application does not include a preoperational or construction and operations monitoring program, in violation of the requirements of Criterion 7. ENDAUM and SRIC Phase I Brief at 24. Moreover, they argue, HRI failed to provide a detailed plan regarding a detection monitoring system in order to detect leakage of hazardous constituents from the disposal area. ENDAUM and SRIC Phase I Brief at 26-27; Sam and Morris Phase I Brief at 9-11. Intervenors fail to recognize that Criterion 7 does not apply.

As the NRC Staff pointed out in the SER:

> Because the waste retention ponds are operational features used for waste water management, the monitoring requirements listed in 10 C.F.R. Part 40 Appendix A, Criterion 7 are not applicable to this project. Specifically, the monitoring requirements in Criterion 7

> apply to disposal cells which are used for long-term stabilization of uranium mill tailings.

SER at p. 32 (emphasis added). Thus, because Criterion 7 pertains to disposal cells for long-term stabilization of uranium mill tailings and not liquid waste from ISL mining, HRI's application need not comply with its requirements.[31]

Notwithstanding the inapplicability of Criteria 7 and 7A, HRI has provided sufficient information in support of its application to meet the regulation and protect the public health and safety. Contrary to Intervenors' assertions, HRI has conducted preoperational monitoring at the Churchrock and Crownpoint locations and, consistent with the timing of the projects, will conduct additional preoperational monitoring before construction activities begin. See 1993 Churchrock ER at 136-138 and 155-161; HRI, Inc. Crownpoint Supplementary Environmental Report at 50-54. This data shows that background environmental information was collected seasonally for radon and as a single sample where seasons do not affect results for media such as vegetation, gamma radiation, soil and sediment. Id. For operations, the general environmental monitoring schedule for all of the CUP locations is discussed in the COP Rev. 2.0. See COP Rev. 2.0 at 104. This schedule contains all of the components of a comprehensive environmental monitoring program at an ISL facility.[32] In addition, License Condition 10.30 requires that HRI refine this schedule with a procedural plan as monitoring locations become known and before injection begins. License Condition 10.30. Fulfillment of License Condition 10.30 will simply provide more detailed station locations, etc. The type and number of samples and the method,

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[31] See supra at 15 (criteria F remained essentially identical to the Commission's 1980 regulations for Mill tailings after 1985 amendment to Criteria in Appendix A).

[32] HRI also will have a comprehensive groundwater monitoring program for the mining activity. A discussion of the groundwater program will be addressed at length in future briefs.

frequency and parameters chosen will be the same as those shown in Table 9.5-1. See COP Rev. 2.0, Table 9.5-1.

With respect to the monitoring program, HRI has included such a program within the COP. See COP Rev. 2.0 at 104. Intervenors take issue with the program, complaining that only three months of data is proposed. HRI will begin preoperational monitoring three months before actual production operations begin. COP Rev. 2.0 at 101. As explained above, HRI has provided baseline environmental data within the applications. This baseline information will be compared against the three month preoperational data for quality assurance comparison purposes as described in the COP. See COP Rev. 2.0 at 141.

Intervenors complain that the surface water monitoring method stated in COP Rev. 2.0, Table 9.5-1 is inadequate for retention pond leak detection monitoring. ENDAUM and SRIC Phase I Brief at 27. Intervenors clearly do not understand Table 9.5-1, as it has nothing to do with retention ponds but rather addresses "[p]ermanent impoundments and upstream and downstream surface water passing through the license area; also adjacent impoundments subject to drainage from the license area." COP Rev. 2.0 , Table 9.5-1. Exceeding the requirement stated in Criteria 7A, the COP specifically states that all CUP surface impoundments will be equipped with two impermeable synthetic membrane liners in between which is a space 4 to 5 inches thick that will contain sand, or some other (granular) porous medium, and a drainage network of open piping, forming an underdrain leak detection system. See COP 2.0; SER at 29-30. The inner liner will provide secondary containment for any leakage that may occur. The point of compliance will be the underdrain leak detection system that is contained between the two liners. In addition to the COP, consistent with Criterion 7A, License Condition 10.5 specifically requires that leak detection monitoring be implemented and that in the case fluid is

detected within the leak detection sump, conductivity and chloride must be tested as indicator parameters to confirm a retention pond liner leak. License Condition 10.5.

4. Expansions Are Too Speculative to Be of Concern

On pages 27-29 of their brief, ENDAUM and SRIC express concern that HRI "has not shown that its disposal system can accommodate foreseeable expansions of its operations" in violation of Appendix A. ENDAUM and SRIC Phase I Brief at 27-79. ENDAUM and SRIC reference the language in the Introduction to Appendix A upon which they rely but again fail to cite the entire provision. The relevant portion of the Introduction to Appendix A states:

> The specifications must be developed considering the expected full capacity of the tailings or waste systems and the lifetime of mill operations. Where later expansions of systems or operations may be likely (for example, where large quantities of ore now marginally uneconomical may be stockpiled), the amenability of the disposal system to accommodate increased capacities without degradation in long-term stability and other performance factors must be evaluated.

10 C.F.R. Part 40, Appendix A, Introduction (emphasis added). The specifications referenced here, and ignored by ENDAUM and SRIC, relate to those specifications required by the provisions of 10 C.F.R. § 40.31(h). Id. As stated above, supra at 24-25, section 40.31(h) does not apply to HRI's license application. Because HRI is not required to include proposed specifications "relating to milling operations and the disposition of tailings or wastes resulting from such milling activities" in accordance with 10 C.F.R. § 40.31(h), it need not develop such specifications considering the "expected full capacity of tailings or waste systems and the lifetime of mill operations" as ENDAUM and SRIC suggest.[33]

[33] Moreover, as noted previously, the language in the Introduction to Appendix A upon which ENDAUM and SRIC rely was adopted in 1980 pursuant to the UMTRCA based upon NRC's GEIS on uranium milling operations and management of mill tailings, see supra at 15-16, and was drafted as part of the Appendix A regulatory program to manage mill tailings by setting criteria for siting and disposing of mill tailings piles. See In the Matter of Kerr-McGee Chemical Corporation, 33 NRC 81, 1991 NRC LEXIS 18, 95-104 (1991).

We also note that ENDAUM and SRIC read too much into the discussion of mineralization in the Brushy Basin or Dakota. See ENDAUM and SRIC Phase I Brief at 28-29, citing, COP Rev. 2.0 at 78. Moreover, they totally neglect the discussion in the COP where HRI states the speculative nature of future production at those sites: "[w]hile mineralization stratigraphically above the Westwater is known to exist, HRI has not delineated the extent of this mineralization at this time. Therefore, the feasibility of producing the Brushy Basin, or the Dakota ore is presently unknown." COP Rev. 2.0 at 76. Future production potential is purely speculative.

In further support of the speculative nature of future operations, we note that in developing the CUP plans, see COP 1.4., HRI staff conducted a detailed delineation of all the HRI mineral interests.[34] Based on HRI's knowledge of the mineral resources in the vicinity and the detailed delineation, the CUP is the only recovery that will be feasible in the foreseeable future because other HRI uranium deposits in New Mexico have either not been discovered or will have higher ISL production costs.

5. HRI's License Complies with the Requirements of 10 C.F.R. Part 20

On pages 29-37 of their brief, ENDAUM and SRIC claim that HRI has failed to provide specific information and analyses in the license application required by 10 C.F.R. § 20.2002 for licensing waste disposal by land application, surface discharge, or deep-well injection "as HRI is already contemplating using these alternative methods in some form." ENDAUM and SRIC

[34] Delineation defines the geologic configuration of the ore body and its subsidiary uranium roll fronts, as well as the configuration of the host sand and confining units. This delineation is accomplished by accumulating and mapping information obtained from multiple exploration borings (drill holes), including data from lithologic logs and common subsurface, geophysical logging tools. Once the ore body is delineated it can be evaluated according to certain criteria to determine if it can be economically produced in a given uranium market.

Phase I Brief at 29-30.[35] ENDAUM and SRIC ramble on for page upon page arguing that HRI has failed to provide specifics regarding each disposal method. Id. at 30-32 (deep well injection), 32-35 (surface water discharge), and 35-37 (land application). ENDAUM and SRIC have put the cart before the horse. HRI has not submitted an application to the Commission for deep well injection, surface water discharge, or land application, and therefore, need not satisfy the requirements for applications set forth in section 20.2002 at this time.

Section 20.2002 states:

> A licensee or applicant for a license may apply to the Commission for approval of proposed procedures, not otherwise authorized in the regulations in this chapter, to dispose of licensed material generated in the licensee's activities. Each application shall include:
>
> (a) A description of the waste containing licensed material to be disposed of, including the physical and chemical properties important to risk evaluation, and the proposed manner and conditions of waste disposal; and
>
> (b) An analysis and evaluation of pertinent information on the nature of the environment;
>
> (c) The nature and location of other potentially affected licensed and unlicensed facilities; and
>
> (d) Analyses and procedures to ensure that doses are maintained ALARA and within the dose limits in this part.

10 C.F.R. § 20.2002 (emphasis added). The regulation permits parties to apply to the Commission for approval to dispose of licensed material either before or after they receive a license as "[a] licensee or applicant for a license may apply to the Commission." Id. (emphasis added). Thus, HRI need not meet the requirements of section 20.2002 for applications unless

[35] ENDAUM and SRIC do not take issue with HRI's use of evaporation as they admit that it is authorized by 10 C.F.R. Part 40, Appendix A. See ENDAUM and SRIC Phase I Brief at 29 fn. 14.

and until it files an application for approval to dispose of licensed material in a manner not otherwise authorized, e.g. evaporation.

As the SER points out, with respect to restoration water, "[c]urrently, HRI would be limited to using either surface discharge (with appropriate State or Federal permits/licenses), brine concentration, waste retention ponds, or a combination of these three options to dispose of [restoration][36] waste water." SER at 26. Although NRC approval is unnecessary should HRI decide to use any of these methods of disposal for restoration water, each of these requires additional environmental permits falling outside of the jurisdiction of NRC should HRI decide to employ them.[37] For example, evaporation pond construction is subject to the specifications stated in License Condition 10.26 and state permits and although surface discharge and land application[38] of restoration water are not subject to the requirements of 10 C.F.R. Part 20, disposal of restoration water by these methods will require that the water be treated to the standards set forth in EPA's regulations at 40 C.F.R. § 440 or the State of New Mexico's regulations, or both. Moreover, for surface discharge, an EPA or authorized state National Pollutant Discharge Elimination System ("NPDES") permit is required and for land application, HRI will need to comply with License Condition 11.8. See License Condition 11.8. Finally,

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36 Although the SER states "process" water here, clearly, the Staff intended to refer to "restoration" water as process water cannot be surface discharged under federal/state permits/licenses, e.g. an NPDES permit or equivalent.

37 Restoration waters are not considered 11e.(2) byproduct material, therefore are not NRC regulated. See NRC Staff Technical Position (STP) "Effluent Disposal At Licensed Uranium Recovery Facilities," DWM-95-01 (April 1995).

38 The FEIS describes land application as a disposal technique that uses agricultural irrigation equipment to broadcast waste water on a relatively large area of land. Prior to broadcast, this wastewater undergoes appropriate treatment to remove uranium, and radium, with the resultant water meeting acceptable irrigation quality standards. Application rates are correctly managed so as not to adversely elevate soil salinity levels in the pasture being irrigated. Land application of process water has been used successfully by several ISL projects under NRC or Agreement State regulatory supervision.

deep well injection of restoration water is subject to EPA's requirements in 40 C.F.R. §§ 144-147 or the state equivalent.[39]

With respect to process water, HRI intends to meet the requirements necessary for the management method chosen when the time is appropriate. For example, as indicated in the SER and the License, evaporation pond construction at Chruchrock Section 8 is subject to the specifications stated in License Condition 10.26 and state permits. See License at 10.26; SER at 26-27, 28-30. As indicated above, surface discharge of process water is not permitted under federal/state permits or licenses, see supra at fn. 25; therefore, surface discharge will not be employed by HRI at Churchrock Section 8 for process water. If and when HRI seeks to use land application as means of disposal of process water it will apply to NRC for approval in accordance with section 20.2002 and HRI will treat the water pursuant to the standards set forth in EPA's regulations at 40 C.F.R. § 440 or the State of New Mexico's regulations, or both. Finally, if deep well injection were to be used at Churchrock Section 8, in addition to applying to NRC in accordance with section 20.2002, HRI, as a UIC applicant, would have to satisfy the EPA's regulatory provisions in 40 C.F.R. § 146 and obtain necessary permits from the EPA and/or the Navajo Nation and the State of New Mexico where they are authorized by EPA to enforce these provisions.

As an aside, URI operates its Texas ISL recovery facilities with a full suite of authorizations including; Radioactive Materials Licenses and UIC Class I Permits (deep well

[39] We note that HRI's license does not presently authorize the use of deep well injection. In fact, at this time HRI does not know if any CUP location has suitable geology for deep well disposal. In evaluating the safety of deep well injection NRC staff looked at the successful use of deep wells at other ISL sites and the fact that there is a well established EPA Underground Injection Control (UIC) program that assures safety and public participation before an operation permit could be issued. In other words, in addition to obtaining a license from NRC, any UIC applicants must satisfy the EPA's regulatory provisions in 40 CFR 146: Underground Injection Control (UIC) Program: Criteria and Standards, and obtain necessary permits from the EPA and/or the Navajo Nation and the State of New Mexico where they are authorized by EPA to enforce these provisions. However, at this time deep well disposal permitting is not slated for the Curchrock Section 8 site.

disposal) and Class III Permits (mineral recovery). See Affidavit of Mark Pelizza. Thus, HRI is familiar with the process of acquiring the necessary licenses, permits, etc. from the relevant authorities to operate an ISL facility.

B. The FEIS Adequately Evaluates the Environmental Effects of HRI's Liquid Waste Disposal System

We now turn to Intervenors' complaints regarding the sufficiency of the FEIS. In sum, Intervenors assert that the FEIS "makes little or no attempt to evaluate any of the four liquid waste disposal methods that HRI is considering" in violation of NEPA. ENDAUM and SRIC Phase I Brief at 38. Intervenors also assert that the FEIS unlawfully defers environmental analysis of the impacts of liquid waste disposal. Id. Intervenors are incorrect.

1. The FEIS Does Not Defer Consideration of the Impacts of Liquid Waste Disposal

On page 43 of their brief, ENDAUM and SRIC take issue with the FEIS' discussion of the liquid waste disposal options available to HRI at the CUP. ENDAUM and SRIC Phase I Brief at 43. Specifically, ENDAUM and SRIC express concern that the FEIS assumes that evaporation ponds will be used for process and restoration water although "HRI has not made a commitment to using evaporation ponds." Id. Moreover, they argue that the other disposal methods available to HRI are not addressed in detail but rather their consideration is deferred until a later date. Id. ENDAUM and SRIC are mistaken. HRI is committed to using evaporation ponds and the FEIS adequately discusses each of the other disposal options.

At the outset, it is important to note that the FEIS describes the basic tenets of the four waste disposal options, i.e., evaporation, deep well injection, surface discharge and land application, and concludes that additional applications, license amendments, and/or permits from other federal and state agencies will be required before certain disposal related activities are

undertaken by HRI. FEIS at 2-18. Any license amendment would include an environmental and safety review.

With respect to HRI's use of evaporation ponds, the FEIS clearly states that the proposed project will use evaporation ponds. FEIS at 2-18, 4-80. Moreover, in section 4.0 of the FEIS, "Environmental Consequences, Monitoring and Mitigation," NRC evaluates the impact of evaporation ponds on geology and soils and on groundwater. See FEIS at 4-6, and 4-25. The FEIS also evaluates the adequacy of pond construction and design and concludes that the proposed general pond designs, which must meet Appendix A and NRC guidance criteria, and pond locations do not pose any unusual safety concerns. FEIS at 4-64 - 4-65, 4-73. Moreover, with respect to off-site releases, the FEIS states "[t]he use of evaporation ponds would result in minimal off-site releases under normal operations because of the proposed pressurized system's removing the radon from the circuit and future decontamination and disposal of the pond residues in licensed waste disposal facilities." FEIS at 4-80.

With regard to the discussion of the other disposal options, a discussion of land application is not deferred, but rather, the FEIS addresses land application in detail. Land application would only be used for water resulting from restoration activities at each of the facilities. FEIS at 4-80. Thus, although no process water will be land applied and, strictly speaking, restoration fluids are not subject to NRC jurisdiction as they are not byproduct material, this disposal method is evaluated in the FEIS using general conservative criteria and is determined to be an environmentally acceptable alternative. FEIS at 4-7, 4-10 & 4-11, 4-40, 4-50, 4-53, 4-80 - 4-83. The expected quality of the water that will be used in land application is discussed within the FEIS in detail. See FEIS at 4-9. Moreover, the impacts of land application are discussed at 4-80, 4-83 and 4-90 of the FEIS. The FEIS states that "disposal of treated water by land application would not be likely to result in harmful accumulations of salts in soil and

vegetation because the water would be relatively clean." FEIS at 4-90. The Staff recognized in the FEIS that "HRI did not submit a detailed plan for land application and would need to submit a detailed license amendment in the future to use land application for wastewater . . . [a]n environmental assessment of the license amendment for land application would be completed as part of the licensing process." FEIS at 4-80. The license amendment would need to include "an irrigation plan . . . address[ing], among other things, application rates, water chemistry, and predicted salt accumulations and their potential impacts." FEIS at 4-90. Thus, the FEIS adequately addresses land application and states that HRI seek appropriate licenses or permits, if necessary, when and if this method of disposal is to be employed.

Similarly, a discussion of surface discharge and deep well injection is not deferred but rather, is detailed in the FEIS in section 4.6.2.3. FEIS at 4-86. As the NRC Staff states in the FEIS, "HRI would need to receive a NPDES permit from the appropriate authority (EPA or the State of New Mexico) to allow surface discharge of wastewater." FEIS at 4-86 - 87. The Staff details in the FEIS the expected concentration of radium and uranium as a result of disposal by surface discharge and determines that based on expected uranium concentrations, HRI would be required to submit information to NRC per 10 C.F.R. § 20.2002 and to request an exemption to 10 C.F.R. Part 20, Appendix B, in addition to receiving the required NPDES permit. Id. With regard to deep-well injection, NRC Staff concluded that this method of disposal "would reduce exposures to the public from the waste disposal techniques to nearly zero." FEIS at 4-87. Moreover, the Staff determined that "[t]he requirements and concepts behind deep well disposal would result in no credible scenario in which members of the public could contact the waste, especially at initial concentrations." Id. NRC noted that to be allowed to conduct deep well disposal, HRI would be required to submit information to NRC in a license amendment application pursuant to 10 C.F.R. § 20.2002 detailing the operations and hazards of the proposed

deep well. Id. In addition, HRI would be required to obtain a UIC permit from EPA pursuant to 40 C.F.R. § 146. Thus, it is clear that the NRC Staff did not defer discussion of surface discharge and deep well injection in the FEIS, but rather, adequately addressed both methods and would require license amendments when and if these methods of disposal are to be used by HRI.

2. The FEIS Adequately Addresses the Size of the Waste Stream and the Potential Impacts of Ponds and Land Application

On page 45 of their brief, ENDAUM and SRIC mistakenly assert that "the FEIS does not properly identify the size of the water stream," and that the bleed is 40 gpm yet the amount of waste is inconsistently described as either 1 gpm or 10 gpm. ENDAUM and SRIC Phase I Brief at 45. Petitioners do nothing more than confuse the bleed rate, which is the net overproduction from the mine zone, with disposal quantities after treatment of the bleed. Here again, ENDAUM's and SRIC's arguments reflect their misunderstanding of the ISL mining process. Treatment and reinjection have no effect on the adequacy of the bleed because the purified water is reinjected outside the monitor well ring.

In the Application and the FEIS, flowrates are nominal and approximated. In both the production and restoration phases of the ISL process, flowrate is adjustable and can be readily controlled by the operator. Early in the COP, HRI established that each area would have a nominal production flowrate. COP Rev. 2.0 at 2. Bleed rate is based on a percentage of plant throughput, not on a inflexible fixed rate of 40 gpm. The planned 1- percent of plant cumulative extraction rate is commonly used by the industry. If, for example, 1000 gpm is extracted, 990 is re-injected, resulting in 10 gpm bleed; the maximum allowable flowrate in the License of 4000 gpm would result in a 40-gpm bleed. However, the operator controls the production rate and therefore the actual bleed rate will be based on the production flow but in any event, will be nominal in comparison to the flowrate. Intervenors take issue with different flowrates found in

the Application documents but do not attempt to understand why the numbers vary. They note that the production bleed rate is 40 gpm but clearly are confused about why after treatment two effluent quantities remain; 1 gpm and 10 gpm. The 1-gpm rate reflects the use of RO and brine concentration and the 10 gpm number is based upon the use of RO only. HRI could use either reduction technique, depending on the availability of water rights and disposal capacity, and dispose of brine in either a retention pond or disposal well. At this point in time, HRI plans on using brine concentration to reduce the liquid effluent, and evaporation because insufficient water rights are available for other options and the availability of a deep well disposal zone has not been verified.

a. The FEIS and the ERs Adequately Describe the Retention Pond System

ENDAUM and SRIC take issue with the FEIS' description of the retention ponds as it "lacks to (sic) most basic information necessary to evaluate their adequacy." ENDAUM and SRIC Phase I Brief at 47. Specifically, they argue that the FEIS fails to provide clear information on the dimensions of the ponds. Id. They further argue that "HRI's ERs do not provide any additional information on the dimension of [the] ponds."[40] Id.

With regard to the pond dimensions, Intervenors complain that references to the pond size are ambiguous. They note two references in the FEIS that refer to pond size: FEIS at 2-12

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[40] We note that this is the only place in their briefs that Intervenors challenge the adequacy of the ER. Because the Staff's discussion of the issue of the retention pond system in the FEIS is based upon, and parallels, the information provided by the HRI in the ERs, the Presiding Officer need not separately address the adequacy of HRI's treatment of this issue in the ER. Therefore, the Presiding Officer should focus on the ultimate question of whether the treatment of retention pond system in the FEIS is adequate. See In the Matter of Louisiana Energy Services, 1996 NRC LEXIS at *35; see supra at 20-21. In any event, Intervenors claim that HRI, in the 1988 Church Rock Environmental Report provided certain details on the number, size and capacity of ponds at the Churchrock project and omitted this information in the Revised Environmental Report dated March 16, 1993, is incorrect. Figure 3.2-1, entitled "Churchrock Project Plant Location" clearly shows the scaled location of the satellite facility and four ponds. Two ponds are 120' by 120' and two ponds are 350' by 350'. These ponds encompass an area of approximately six acres as described in the FEIS. FEIS at 2-26. Similarly, contrary to Intervenors' assertion, Figure 3.2-1, entitled Crownpoint Project Site Layout, HRI, Inc. Crownpoint Project In-Situ

states that the ponds will be six acres each and FEIS at 2-26 state that the ponds would occupy six acres total. In fact, HRI plans that the ponds will occupy 6 acres total.

Finally, Intervenors complain that the description of the pond liners in the FEIS is inadequate. ENDAUM and SRIC Phase I Brief at 47. The details regarding the design and construction of pond liners is discussed at length above. See supra at 29. The level of discussion in the FEIS is adequate and has resulted in the NRC Staff placing conditions on HRI's license with respect to liner and pond design.[41] FEIS at 2-12, 4-64 & 4-65.

b. The FEIS Adequately Describes the Evaporation Pond System

On page 48 of their brief, ENDAUM and SRIC state that HRI estimates 100 acres of evaporation ponds will be required at each site. ENDAUM and SRIC Phase I Brief at 48. To place this into context, where evaporation is discussed in the COP, HRI calculates that 100 acres of ponds would be required to dispose of 250 gpm of water using an evaporation rate of 2.5 gpm per acre. Intervenors do not understand that the 100 acres of ponds is used in the COP for illustration purposes and that development of 100 acres of ponds is not the intent of HRI at the CUP as it makes no business or practical sense. As indicated above, supra at 46, HRI plans that the ponds will occupy 6 acres total. COP Rev. 2.0 at 29. Moreover, Intervenors ignore the discussion in the COP describing how the acreage of evaporation could be reduced by more than half simply by installing an inexpensive spray system. COP Rev. 2.0 at 59.

Technical Report at 78 ACN No. 9509080094 (June 1992), clearly shows the scaled location of site buildings and three existing ponds.

[41] Again, for above ground ponds, HRI must meet the specifications stated in NRC Regulatory Guide 3.11, "Design, Construction, and Inspection of Embankment Retention Systems for Uranium Mills" for dikes to be employed. SER at 29. At Churchrock Section 8, the area where the ponds will be developed is flat; accordingly, below ground level design is anticipated. See HRI, Inc., Churchrock Revised Environmental Report at 179 (March 16, 1993)(Hearing Record ACN No. 9304130415) Figure 3.2-1. All ponds will be equipped with a second liner and leak detection system, to safeguard against leaks in the exposed liner. See COP at 29; SER at 29; License Condition 10.26.

Moreover, Intevenors ignore the fact that RO treatment will reduce the amount of needed pond capacity by 65-75 percent. COP Rev. 2.0 at 56. Brine concentration will further reduce the amount of needed pond capacity to the point where approximately 1 gallon per minute would be subject to evaporation.

Even if 100 acres of evaporation ponds were used, the FEIS adequately discusses the effect of such use on the environment. See FEIS at 2-18, 2-29, 4-6, 4-88, 4-91, 4-95, 4-111. Specifically, the FEIS review includes the impacts of large evaporation ponds on soils, geology, ecology and cultural resources.

c. Existing Ponds Will Not Be Used at Section 8 and Therefore the Adequacy of the Discussion of Their Use in the FEIS is Not At Issue at This Time

ENDAUM and SRIC state that the FEIS "ignores the potential adverse impacts of using old ponds for retention or evaporation." ENDAUM and SRIC Phase I Brief at 49. The existing ponds that HRI has considered employing are located at Section 17 and Crownpoint. In fact, section 17 existing ponds will not be used. If existing ponds at Crownpoint are used, they will be subject to the improvements contained in the COP. As stated above, the September 22, 1998, Order states that Intervenors are permitted to submit written presentations with respect to any aspect of the HRI license concerning operations at Church Rock Section 8 but are precluded from presenting concerns relating to Church Rock Section 17, Unit 1, or the Crownpoint sections at this time. See September 22 Order at 2. Thus, as the use of existing ponds does not relate to the operations at Section 8, ENDAUM and SRIC raise arguments that are not at issue at this time.

d. The FEIS Adequately Analyzes Impacts of Retention and Evaporation Ponds on Migratory Waterfowl

On pages 50-52 of their brief, ENDAUM and SRIC complain that avian wildlife may be harmed by the retention and evaporation ponds at Section 8 and that the Staff's review of the

effect of the ponds on avian wildlife in the FEIS is deficient. ENDAUM and SRIC Brief at 50-52. They also argue that HRI's license should contain a provision requiring HRI to "implement methods for discouraging waterfowl use of project retention or evaporation ponds." Id. at 50. ENDAUM and SRIC ignore the plain language of the FEIS.

The FEIS plainly states "[t]he ponds are not expected to pose significant risk to any migrating waterfowl using them because concentrations of hazardous constituents would be negligible or small. The ponds would store water during the treatment process, and would contain either purified water before it is released (evaporation ponds) or brackish water and briny sludge (process water retention ponds)." FEIS at 4-90. Moreover, the NRC Staff addresses the constituents of the water contained in the ponds in detail before concluding that: ". . . concentrations of potentially harmful substances in the wastewater retention ponds would not be high enough to harm birds that might choose to use the ponds as a temporary stopover or resting place during migration. Birds using the evaporation ponds would not be exposed to hazardous substances because the water would have been treated to remove most impurities." Id.

With respect to license conditions regarding waterfowl, as indicated above, the license does contain restrictions requiring that pond design be reviewed and approved prior to construction. See License Condition 10.26. As the Staff indicates in the FEIS, "the review process would include provisions for stipulating water quality and for subsequent monitoring. Although bioassays may not be practical or necessary, methods of monitoring water and sludge quantity in the ponds and for controlling waterfowl access are stipulated in the proposed license conditions. NRC staff also recommend several physical measures to discourage waterfowl use of the ponds in the proposed license conditions."[42] FEIS at A-44.

[42] The proposed license conditions referenced here were incorporated into License Condition 10.26.

e. The FEIS Adequately Addresses the Impacts from Land Application

Intervenors complain that the analysis of land application is inaccurate and incomplete because the actual land parcel that is slated for irrigation is not properly described and that the irrigation water quality has not been properly approximated. ENDAUM and SRIC Phase I Brief at 52.

Again, HRI has not submitted an application for land application to date. At Churchrock, HRI has identified a number of land parcels that at first blush seem to qualify for land application and described these in the COP Rev. 2.0. See COP 2.0 at 42-43. Still no specific parcel has formally been chosen; thus, "HRI proposed to file an application with NRC at the time irrigation plans for the Church Rock site have been finalized." FEIS at 4-11. In order to evaluate the potential environmental impacts in the FEIS of such disposal, "NRC staff assumed that land application could occur at any of the four potential sites, but that no more than 259 ha (640 acres) would be affected." Id. Based on this analysis, the Staff concluded that "[l]and application associated with the Church Rock site would have impacts similar to those described for the Crownpoint site in Section 4.2.1.1." Id.

Moreover, with respect to radiological impact, the Staff chose a 52-acre site for the FEIS Radiological Impact Evaluation. FEIS at 4-83. It is the smallest of all the parcels described in the COP, and as such would produce the highest calculated hypothetical radiological impact. Even so, radiological impacts were found to be within the appropriate standards. FEIS at 4-83 - 84.

ENDAUM's and SRIC's criticism of HRI's estimated restoration water quality is perplexing. They complain about the source of information, that the method used to achieve the estimate was not scientific, and that certain parameters that are unique to the Mobil Section 9

data that were "removed" as outliers should have been included in the statistical population. ENDAUM and SRIC Phase I Brief at 52-53.

With respect to the source of the information and the method used to achieve the estimate, Intervenors state that "the basis for the Staff's determination that . . . impacts "would be low" appears to be based on data submitted by HRI that are not waste characterization data from actual treatment or application of restoration wastewater" and that "these figures are unrepresentative of wastewater from ISL mining." ENDAUM and SRIC Phase I Brief at 52-53. In estimating the water quality of restoration water for land application, it is reasonable to presume that over the life of the restoration activity, water quality parameters would fall somewhere between baseline and the maximum concentration in leach solution because water quality starts with the constituents resembling "lixiviant" and then progressively improves and approaches baseline as restoration proceeds. Intervenors ignore the fact that water quality concentrations are not static during the restoration cycle. The estimated values presented in RAI 29 and the FEIS at Table 4.4 are the combined averages of leach solution from core tests and area baseline values. This is the method typically used in the industry to establish leaching parameters.

With regard to Intervenors' claims regarding the "removal" of manganese, molybdenum, and selenium data from HRI's calculations of average land application water quality, the Mobil data for these parameters were not included because these elements do not exist in significant quantities in the HRI Churchrock, Crownpoint or Unit 1 orebodies as shown in the leach tests. See RAI No.29. At Churchrock, oxidation of the rock does not produce manganese, molybdenum or selenium values based on water quality analysis from the oxidized mine workings at Churchrock. Id. Thus, it was appropriate to calculate water quality without including the Mobil data on manganese, molybdenum, and selenium.

IV. CONCLUSION

HRI has satisfied all requirements for obtaining the Materials License at issue. For all the aforementioned reasons, Intervenors' request that the Presiding Officer revoke HRI's license to operate at Churchrock Section 8 should be DENIED.

Respectfully submitted this 9th day of December, 1998.

Anthony J. Thompson
Frederick S. Phillips
David C. Lashway
SHAW, PITTMAN, POTTS & TROWBRIDGE
2300 N Street, N.W.
Washington, D.C. 20037-1128
Tel.: (202) 663-8000
Fax: (202) 663-8007

Jeptha P. Hill
Law Office of Jeptha P. Hill
816 Congress Avenue, Suite 1100
Austin, Texas 78701-2443

ON BEHALF OF HYDRO RESOURCES, INC.
2929 Coors Road, Suite 101
Albuquerque, New Mexico 87120

December 9, 1998

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD PANEL

Before Administrative Judges:
Peter B. Bloch, Presiding Officer
Thomas D. Murphy, Special Agent

In the Matter of:	)	
HYDRO RESOURCES, INC. 2929 Coors Road, Suite 101 Albuquerque, NM 87120	)	Docket No. 40-8968-ML ASLBP No. 95-706-01-ML

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing document (Hydro Resources, Inc.'s Response To Intervenors' November 9, 1998 Briefs In Opposition To Application For A Materials License With Respect To Liquid Waste Disposal Issues) in the above-captioned proceeding have been served on the following by facsimile and first-class mail on this 9th day of December, 1998.

Administrative Judge
Peter B. Bloch, Presiding Officer
Atomic Safety and Licensing Board
Two White Flint North
11545 Rockville Pike
U.S. Nuclear Regulatory Commission
Rockville, Maryland 20852

Adjudicatory File
Atomic Safety and Licensing Board
One White Flint North
11555 Rockville Pike
U.S. Nuclear Regulatory Commission
Rockville, Maryland 20852

Office of the Secretary
Attn: Rulemakings and Adjudications Staff
One White Flint North
11555 Rockville Pike
U.S. Nuclear Regulatory Commission
Rockville, Maryland 20852

Office of Commission Appellate
Adjudication
One White Flint North
11555 Rockville Pike
U.S. Nuclear Regulatory Commission
Rockville, Maryland 20852

Administrative Judge
Thomas D. Murphy
Special Assistant
Atomic Safety and Licensing Board
Two White Flint North
11545 Rockville Pike
U.S. Nuclear Regulatory Commission
Rockville, Maryland 20852

Atomic Safety and Licensing Board Panel
One White Flint North
11555 Rockville Pike
U.S. Nuclear Regulatory Commission
Rockville, Maryland 20852

Jep Hill, Esq.
Jep Hill and Associates
816 Congress Avenue, Suite 1100
Austin, Texas 78701

Richard F. Clement, Jr., President
Hydro Resources, Inc.
2929 Coors Road, Suite 101
Albuquerque, New Mexico 87120

Mitzi Young
John Hull
Office of the General Counsel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Douglas Meikeljohn
Johanna Matanich
New Mexico Environmental Law Center
1405 Luisa Street Suite 5
Santa Fe, NM 87505

Mr. Mark Pelizza
Vice President
URI, Inc.
Lockbox 12 – 12750 Merit Drive, Suite 1020
Dallas, TX 75251

Diane Curran, Esq.
Harmon, Curran, Spielberg & Eisenberg
2001 S Street, N.W., Suite 430
Washington, D.C. 20009

Mitchell W. Capitan, President
Eastern Navajo-Diné Against
Uranium Mining
P.O. Box 471
Crownpoint, New Mexico 87313

W. Paul Robinson
Chris Shuey
Southwest Research and Information Center
P.O. Box 4524
Albuquerque, New Mexico 87106

Marilyn Morris
c/o Roderick Ventura
and Samuel D. Gollis
DNA - People's Legal Services, Inc.
P.O. Box 306
Window Rock, AZ 86515

Grace Sam
c/o Roderick Ventura
and Samuel D. Gollis
DNA - People's Legal Services, Inc.
P.O. Box 306
Window Rock, AZ 86515

David Lashway

David C. Lashway
SHAW PITTMAN POTTS & TROWBRIDGE
2300 N Street, N.W.
Washington, DC 20037
Counsel for Hydro Resources, Inc.