UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
CROW BUTTE RESOURCES, INC. ,	)	Docket No. 40-8943
	)	ASLBP No. 08-867-02-OLA-BD01
(License Renewal for the	)	
In Situ Leach Facility, Crawford, Nebraska)	)	March 16, 2015

CONSOLIDATED INTERVENORS' MOTION FOR ADDITIONAL CONTENTIONS BASED ON EPA PROPOSED RULES

In accordance with the briefing schedule established by the Board in its Order dated March 9, 2015, the Consolidated Intervenors hereby file their timely motion proffering additional contentions.

EPA'S PROPOSED RULES

On January 26, 2015, the U.S. Environmental Protection Agency ("EPA") published in the Federal Register a battery of proposed rules and amendments to its current "Human and Environmental Protection Standards for Uranium and Thorium Mill Tailings." 80 Fed. Reg. 4156 et. seq. (January 26, 2015) (amending 40 C.F.R. part 192) [hereafter "Proposed Rules"]. The Proposed Rules are the result of years of study by the EPA into the environmental impacts of in situ leach mining of uranium. In pertinent part, the Proposed Rules provide that:

> In the absence of explicit regulatory language addressing ISR facilities, NRC and its Agreement States have used guidance and license conditions to implement many aspects of groundwater protection programs, including the selection of restoration goals and post-restoration monitoring. Based upon the information that we have reviewed, **we believe an even more rigorous approach is warranted for (a) determining background groundwater concentrations, which are necessary to establish appropriate restoration goals, (b) establishing restoration goals, and (c) demonstrating the continued stability of groundwater after restoration.** In addition, prolonged stability monitoring is needed to provide the necessary level of confidence that groundwater quality will not degrade over time or promote contaminant migration in the future.

80 Fed. Reg. at 4165 (internal citations omitted) (emphasis added). The Consolidated Intervenors admit that the Proposed Rules are just that, "proposed," and acknowledge that after the notice and comment period, the Proposed Rules may be amended significantly or withdrawn entirely. However, the publication of the Proposed Rules in the Federal Register demonstrate EPA's acknowledgement of a significant dearth of regulatory specificity regarding in situ leach uranium mines. Further the procedures described in the Proposed Rules contemplate substantial additional requirements on in situ leach mine operators and their regulatory agencies that merit consideration as they are likely to take effect during the renewal period that is the subject of this action.

The Proposed Rules give rise to a number of additional new contentions. 10 CFR Sect. 2.309c governs the admissibility of new contentions filed after the applicable deadline and requires:

> (i) The information upon which the filing is based was not previously available;
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> (ii) The information upon which the filing is based is materially different from information previously available; and
>
> (iii) The filing has been submitted in a timely fashion based on the availability of the subsequent information.

In the instant case, all of these requirements are readily present on their face. The Proposed Rules were not published until three weeks after the initial filing deadline. While Consolidated Intervenors have already raised many concerns that are substantially similar to those identified by the EPA in the Proposed Rules, by definition, the amendment to 40 C.F.R. part 192 proposed by the agency is materially different from any information previously available. Finally the Board established a briefing schedule in its March 9, 2015 Order that designated today as the filing deadline for any new or amended contentions based on the Proposed Rules.

APPLICABLE LEGAL STANDARDS

The Atomic Energy Act of 1954, as amended ("AEA"), expressly provides that "the Congress of the United States hereby makes the following findings concerning the development, use and control of atomic energy: [t]he development, utilization, and control of atomic energy for military and for all other purposes are vital to the common defense and security, [t]he processing and utilization of source material must be regulated in the national interest and in order to provide for the common defense and security and to protect the health and safety of the public, and [s]ource and special nuclear material, production facilities, and utilization facilities are affected with the public interest, and regulation by the United States of the production and utilization of atomic energy and of the facilities used in connection therewith is necessary in the national interest to assure the common defense and security and to protect the health and safety of the public. AEA Section 2012(a), (c)(d)(e); 42 USC §2012.

Significantly, the national interest and common defense aspects <u>include</u> protecting

the health and safety of the public, including the environment and water resources. "The Atomic Energy Act was passed years before broader environmental concerns prompted enactment of the National Environmental Protection Act ("NEPA"). Yet many of those same concerns permeated provisions of the first-mentioned legislation and the regulations promulgated in accordance with its mandate. To say that these must be regarded independently of the constantly increasing consciousness of environmental risks reflected in proceedings with reference to NEPA, would make for neither practicality nor sense. Nor can AEA requirements be viewed separate and apart from NEPA considerations. Especially in view of NEPA, it also is unreasonable to suppose that risks are automatically acceptable, and may be imposed upon the public by virtue of AEA, merely because operation of a facility will conform to the Commission's basic health and safety standards. The weighing of risks against benefits in view of the circumstances of particular projects is required by NEPA in view of AEA. The two statutes and the regulations promulgated under each must be viewed in *para material.* Citizens for Safe Power, Inc. v. NRC, 524 F.2d 1291, 1299 (DC Cir. 1975).

When, as here, NEPA is among the relevant statutes, the zone of interests is quite wide and includes procedural protections and impacts to aesthetic and other non-economic values. See, *Rocky Mt. Oil & Gas Assoc. v. United States Forest Serv.,* 157 F. Supp. 2d 1142, 1144 (D. Mont. 2000), *aff'd.* 12 Fed. Appx. 498 (2001) *cert denied* 534 U.S. 1018 (holding that "the possibility of oil and gas technology spoiling the pristine scenery and diverse resources" and "value of place" are proper factors to consider when raised by the public in a NEPA analysis). On behalf of its Oglala members, Consolidated Intervenors also have asserted and continue to assert a concrete interest in the protection

of lands, natural resources, economic prosperity, and the health, safety, and welfare of the Oglala, which are all threatened by the continued operation of the Crow Butte ISL/ISR mine.

AEA Section 61 provides that the Commission must "find that the determination that such material is source material is in the interest of the common defense and security. 42 USC 2091. AEA Section 62 provides that "no person may transfer or receive in interstate commerce, transfer, deliver, receive possession of or title to, or import into or export from the United States any source material after removal from its place of deposit in nature. 42 USC 2092. AEA Section 69 provides that **"[t]he Commission shall not license any person to transfer or deliver, receive possession of or title to, or import into or export from the United States any source material if, in the opinion of the Commission, the issuance of a license to such person for such purpose would be inimical to the common defense and security or the health and safety of the public**. 42 USC 2099 (emphasis added).

In order to obtain a source materials license from the NRC, an applicant must file a license application under AEA Section 182. 42 USC 2232. Each application shall be in writing and "shall specifically state such information as the Commission, by rule or regulation, may determine to be necessary to decide such of the technical and financial qualifications of the applicant, the character of the applicant, **the citizenship of the applicant**, or any other qualifications of the applicant as the Commission may deem appropriate for the license. Id. (emphasis added.) The AEA and NEPA requirements for the Crow Butte renewal are set forth in NRC Regulations at 10 CFR Part 40, including Appendix A thereof, and 10 CFR Part 51. See 10 CFR 40.1; 10 CFR 51.1. As described

in NRC Regulation Section 40.1(b), the Part 40 Regulations also contain implementations of title II of the Energy Reorganization Act of 1974, as amended (88 Stat. 1242), and titles I and II of the Uranium Mill Tailings Radiation Control Act of 1978, as amended (42 U.S.C. 7901).

Part 40 Regulations

NRC Regulation Section 40.4 provides that the term "Principal activities," as used in this part [Part 40], means activities authorized by the license which are essential to achieving the purpose(s) for which the license was issued or amended. Storage during which no licensed material is accessed for use or disposal and activities incidental to decontamination or decommissioning are not principal activities.

NRC Regulation Section 40.9 provides that all information provided to the Commission by Applicant shall be complete and accurate in "all material respects." Further, Section 40.9(b) requires Applicant to notify the Commission if Applicant has identified information having a significant implication for public health and safety or common defense and security.

NRC Regulation Section 40.31 provides for the application of a license such as the license at issue in this case. The Commission retains the authority under NRC Regulations Section 40.31(b) to "require further statements in order to enable the Commission to determine whether the application should be granted or denied or whether a license should be modified or revoked." NRC Regulation Section 40.31(h) provides that "each application 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 an application."

NRC Regulation Section 40.31(i) provides that "as provided by § 40.36, certain applications for specific licenses filed under this part must contain a proposed decommissioning funding plan or a certification of financial assurance for decommissioning." NRC Regulations Section 40.36 provides that the financial assurance requirements of Appendix A of Part 40 are applicable to source materials licenses such as the license at issue in this case. See 10 CFR §40.36.

Once the Commission has received full disclosure in an application, and in responses to any and all follow up requests for information, it may approve the sought after source materials license in accordance with Section 40.32 if: (a) The application is for a purpose authorized by the Act; (b) The applicant is qualified by reason of training and experience to use the source material for the purpose requested in such manner as to protect health and minimize danger to life or property; **(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.** 10 CFR 40.32 (emphasis added); 10 CFR 40.45.

NRC Regulations Section 40.41(c) provides, in pertinent part, that:

§ 40.41 Terms and conditions of licenses.

> (a) Each license issued pursuant to the regulations in this part shall be subject to all the provisions of the act, now or hereafter in effect, and to all rules, regulations and orders of the Commission.
> ***
> (c) Each person licensed by the Commission pursuant to the regulations in this part shall confine his possession and use of source or byproduct material to the

locations and purposes authorized in the license. Except as otherwise provided in the license, a license issued pursuant to the regulations in this part shall carry with it the right to receive, possess, and use source or byproduct material.
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(e) The Commission may incorporate in any license at the time of issuance, or thereafter, by appropriate rule, regulation or order, such additional requirements and conditions with respect to the licensee's receipt, possession, use, and transfer of source or byproduct material as it deems appropriate or necessary in order to:
(1) Promote the common defense and security;
(2) Protect health or to minimize danger of life or property;
(3) Protect restricted data;
(4) Require such reports and the keeping of such records, and to provide for such inspections of activities under the license as may be necessary or appropriate to effectuate the purposes of the act and regulations thereunder.
(f)(1) Each licensee shall notify the appropriate NRC Regional Administrator, in writing, immediately following the filing of a voluntary or involuntary petition for bankruptcy under any chapter of title 11 (Bankruptcy) of the United States Code by or against:
(i) The licensee; (ii) An entity (as that term is defined in 11 U.S.C. 101(14)) controlling the licensee or listing the license or licensee as property of the estate; or (iii) An affiliate (as that term is defined in 11 U.S.C. 101(2)) of the licensee.
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(h) Each licensee shall ensure that Safeguards Information is protected against unauthorized disclosure in accordance with the requirements in § 73.21 and the requirements of § 73.22 or § 73.23 of this chapter, as applicable.

NRC Regulations 40.42 provides for decommissioning, in pertinent part, as follows:

§ 40.42 Expiration and termination of licenses and decommissioning of sites and separate buildings or outdoor areas.

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(d) Within 60 days of the occurrence of any of the following, consistent with the administrative directions in § 40.5, each licensee shall provide notification to the NRC in writing and either begin decommissioning its site, …or submit within 12 months of notification a decommissioning plan, if required by paragraph (g)(1) of this section, and begin decommissioning upon approval of that plan if--
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(2) The licensee has decided to permanently cease principal activities, as defined in this part, at the entire site or in any separate building or outdoor area; or
(3) No principal activities under the license have been conducted for a period of 24 months…

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(e) Coincident with the notification required by paragraph (d) of this section, the licensee shall maintain in effect all decommissioning financial assurances established by the licensee pursuant to § 40.36 in conjunction with a license issuance or renewal or as required by this section. The amount of the financial assurance must be increased, or may be decreased, as appropriate, to cover the detailed cost estimate for decommissioning established pursuant to paragraph (g)(4)(v) of this section. (Emphasis added.)

(g)(4)(v) An updated detailed cost estimate for decommissioning, comparison of that estimate with present funds set aside for decommissioning, and a plan for assuring the availability of adequate funds for completion of decommissioning. (Emphasis added.)

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(g)(5) The proposed decommissioning plan will be approved by the Commission if the information therein demonstrates that the decommissioning will be completed as soon as practicable and that the health and safety of workers and the public will be adequately protected.

(i) The Commission may approve a request for an alternate schedule for completion of decommissioning of the site or separate building or outdoor area, and license termination if appropriate, if the Commission determines that the alternative is warranted by consideration of the following:…(1)…(2)…(3)…(4)…

…(5) Other site-specific factors which the Commission may consider appropriate on a case-by-case basis, such as the regulatory requirements of other government agencies, lawsuits, ground-water treatment activities, monitored natural ground-water restoration, actions that could result in more environmental harm than deferred cleanup, and other factors beyond the control of the licensee. (Emphasis added.)

Appendix A to Part 40

NRC Regulations at Appendix A to Part 40 provide, among other things:

> Appendix A to Part 40—Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material From Ores Processed Primarily for Their Source Material Content
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> …
>
> The specifications must be developed considering the expected full capacity of 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.
>
> 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 meterology. **The Commission may find that the proposed alternatives meet the Commission's requirements if the 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 the sites, which is equivalent to, to the extent practicable, or more stringent than the level which would be achieved by the requirements of this Appendix and the standards promulgated by the Environmental Protection Agency in 40 CFR Part 192, Subparts D and E. (Emphasis added.)**[1]
>
> 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 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.

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Appendix A of Part 40 further provides, among other things:

> Criterion 5—Criteria 5A-5D and new Criterion 13 incorporate the basic ground-water protection standards imposed by the Environmental Protection Agency in 40 CFR Part 192, Subparts D and E (48 FR 45926; October 7, 1983) which apply during operations and prior to the end of closure. Ground-water monitoring to comply with these standards is required by Criterion 7A.

Clearly Criterion 5 implicates groundwater monitoring during operations and

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[1] Upon the effectiveness of the Proposed Rules, a new 'Subpart F' will become part of 40 CFR Part 192 and will likewise be applicable to Crow Butte in the instant matter by the application of Appendix A to Part 40.

prior to closure with reference to Criterion 7A, and the Proposed Rules in new Subpart F will also apply by their terms to impose groundwater monitoring standards and reports during restoration and decommissioning, and may apply to the exclusion or to the modification of what is set forth in Criterion 7A. See Proposed Rules at 80 Fed. Reg. 4172-4174, 4185.

Appendix A to Part 40 provides further, among other things, that:

> 5B(1)—Uranium and thorium byproduct materials must be managed to conform to the following secondary ground-water protection standard: Hazardous constituents entering the ground water from a licensed site must not exceed the specified concentration limits in the uppermost aquifer beyond the point of compliance during the compliance period. Hazardous constituents are those constituents identified by the Commission pursuant to paragraph 5B(2) of this criterion. Specified concentration limits are those limits established by the Commission as indicated in paragraph 5B(5) of this criterion. The Commission will also establish the point of compliance and compliance period on a site specific basis through license conditions and orders. The objective in selecting the point of compliance is to provide the earliest practicable warning that the impoundment is releasing hazardous constituents to the ground water. The point of compliance must be selected to provide prompt indication of ground-water contamination on the hydraulically downgradient edge of the disposal area. The Commission shall identify hazardous constituents, establish concentration limits, set the compliance period, and may adjust the point of compliance if needed to accord with developed data and site information as to the flow of ground water or contaminants, when the detection monitoring established under Criterion 7A indicates leakage of hazardous constituents from the disposal area.
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> ***
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> 5B(2)—A constituent becomes a hazardous constituent subject to paragraph 5B(5) only when the constituent meets all three of the following tests:
> (a) The constituent is reasonably expected to be in or derived from the byproduct material in the disposal area;
> (b) The constituent has been detected in the ground water in the uppermost aquifer; and
> (c) The constituent is listed in Criterion 13 of this appendix.
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> ***

5B(3)—Even when constituents meet all three tests in paragraph 5B(2) of this criterion, the Commission may exclude a detected constituent from the set of hazardous constituents on a site specific basis if it finds that the constituent is not capable of posing a substantial present or potential hazard to human health or the environment.

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5B(4)—In making any determinations under paragraphs 5B(3) and 5B(6) of this criterion about the use of ground water in the area around the facility, the Commission will consider any identification of underground sources of drinking water and exempted aquifers made by the Environmental Protection Agency.

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5B(5)—At the point of compliance, the concentration of a hazardous constituent must not exceed—
(a) The Commission approved background concentration of that constituent in the ground water;
(b) The respective value given in the table in paragraph 5C if the constituent is listed in the table and if the background level of the constituent is below the value listed; or
(c) An alternate concentration limit established by the Commission.

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5B(6)—Conceptually, background concentrations pose no incremental hazards and the drinking water limits in paragraph 5C state acceptable hazards but these two options may not be practically achievable at a specific site. Alternate concentration limits that present no significant hazard may be proposed by licensees for Commission consideration. Licensees must provide the basis for any proposed limits including consideration of practicable corrective actions, that limits are as low as reasonably achievable, and information on the factors the Commission must consider. The Commission will establish a site specific alternate concentration limit for a hazardous constituent as provided in paragraph 5B(5) of this criterion if it finds that the proposed limit is as low as reasonably achievable, after considering practicable corrective actions, and that the constituent will not pose a substantial present or potential hazard to human health or the environment as long as the alternate concentration limit is not exceeded.

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5C-Maximum Values for Ground-Water Protection

Constituent or property	Maximum concentration
Milligrams per liter:	
Arsenic	0.05
Barium	1.0
Cadmium	0.01
Chromium	0.05
Lead	0.05
Mercury	0.002
Selenium	0.01
Silver	0.05
Endrin (1,2,3,4,10,10-hexachloro-1,7 -expoxy-1,4,4a,5,6,7,8,9a-octahydro-1, 4-endo, endo-5, 8- dimethano napthalene)	0.0002
Lindane (1,2,3,4,5,6-hexachlorocyclohexane, gamma isomer)	0.004
Methoxychlor (1,1,1-Trichloro-2,2-bis (p-methoxyphenylethane)	0.1
Toxaphene (C_{10} H_{10} Cl_6, Technical chlorinated camphene, 67-69 percent chlorine)	0.005
2, 4-D(2,4-Dichlorophenoxyacetic acid)	0.1
2, 4,5-TP Silvex (2,4,5-Trichlorophenoxypropionic acid)	
Picocuries per liter:	
Combined radium-226 and radium-228	5
Gross alpha-particle activity (excluding radon and uranium when producing uranium byproduct material or radon and thorium when producing thorium byproduct material)	15

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5D-If the ground-water protection standards established under paragraph 5B(1) of this criterion are exceeded at a licensed site, a corrective action program must be put into operation as soon as is practicable, and in no event later than eighteen (18) months after the Commission finds that the standards have been exceeded. The licensee shall submit the proposed corrective action program and supporting rationale for Commission approval prior to putting the program into operation, unless otherwise agreed to by the Commission. The objective of the program is to return hazardous constituent concentration levels in ground water to the concentration levels set as standards. The licensee's proposed program must address removing hazardous constituents that have entered the ground water at the point of compliance or treating them in place. The program must also address removing or treating any hazardous constituents that exceed concentration limits in ground water between the point of compliance and the downgradient facility property boundary. The licensee shall continue corrective action measures to the extent necessary to achieve and maintain compliance with the groundwater standard. The Commission will determine when the licensee may terminate corrective action measures based on data from the ground-water monitoring program and other information that provide reasonable assurance that the ground-water protection standard will not be exceeded.

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5E-In developing and conducting ground-water protection programs, applicants and licensees shall also consider the following:
(1) Installation of bottom liners(Where synthetic liners are used, a leakage detection system must be installed immediately below the liner to ensure major failures are detected if they occur. This is in addition to the ground-water monitoring program conducted as provided in Criterion 7. Where clay liners are proposed or relatively thin, in-situ clay soils are to be relied upon for seepage control, tests must be conducted with representative tailings solutions and clay materials to confirm that no significant deterioration of permeability or stability properties will occur with continuous exposure of clay to tailings solutions. Tests must be run for a sufficient period of time to reveal any effects if they are going to occur (in some cases deterioration has been observed to occur rather rapidly after about nine months of exposure)).
(2) Mill process designs which provide the maximum practicable recycle of solutions and conservation of water to reduce the net input of liquid to the tailings impoundment.
(3) Dewatering of tailings by process devices and/or in-situ drainage systems (At new sites, tailings must be dewatered by a drainage system installed at the bottom of the impoundment to lower the phreatic surface and reduce the driving head of seepage, unless tests show tailings are not amenable to such a system. Where in-situ dewatering is to be conducted, the impoundment bottom must be graded to assure that the drains are at a low point. The drains must be protected by suitable filter materials to assure that drains remain free running. The drainage system must also be adequately sized to assure good drainage).
(4) Neutralization to promote immobilization of hazardous constituents.

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5F—Where ground-water impacts are occurring at an existing site due to seepage, action must be taken to alleviate conditions that lead to excessive seepage impacts and restore ground-water quality. The specific seepage control and ground-water protection method, or combination of methods, to be used must be worked out on a site-specific basis. Technical specifications must be prepared to control installation of seepage control systems. A quality assurance, testing, and inspection program, which includes supervision by a qualified engineer or scientist, must be established to assure the specifications are met.

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5G—In support of a tailings disposal system proposal, the applicant/operator shall supply information concerning the following:

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5H—Steps must be taken during stockpiling of ore to minimize penetration of radionuclides into underlying soils; suitable methods include lining and/or compaction of ore storage areas.

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Criterion 6—(1) In disposing of waste byproduct material, licensees shall place an earthen cover (or approved alternative) over tailings or wastes at the

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Criterion 6A—(1) For impoundments containing uranium byproduct materials, the final radon barrier must be completed as expeditiously as practicable considering technological feasibility after the pile or impoundment ceases operation in accordance with a written, Commission-approved reclamation plan.

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Criterion 7—At least one full year prior to any major site construction, a preoperational monitoring program must be conducted to provide complete baseline data on a milling site and its environs. Throughout the construction and operating phases of the mill, an operational monitoring program must be conducted to measure or evaluate compliance with applicable standards and regulations; to evaluate performance of control systems and procedures; to evaluate environmental impacts of operation; and to detect potential long-term effects.

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7A—The licensee shall establish a detection monitoring program needed for the Commission to set the site-specific ground-water protection standards in paragraph 5B(1) of this appendix. For all monitoring under this paragraph the licensee or applicant will propose for Commission approval as license conditions which constituents are to be monitored on a site specific basis. A detection monitoring program has two purposes.The initial purpose of the program is to detect leakage of hazardous constituents from the disposal area so that the need to set ground-water protection standards is monitored. If leakage is detected, the second purpose of the program is to generate data and information needed for the Commission to establish the standards under Criterion 5B. The data and information must provide a sufficient basis to identify those hazardous constituents which require concentration limit standards and to enable the Commission to set the limits for those constituents and the

compliance period. They may also need to provide the basis for adjustments to the point of compliance. For licenses in effect September 30, 1983, the detection monitoring programs must have been in place by October 1, 1984. For licenses issued after September 30, 1983, the detection monitoring programs must be in place when specified by the Commission in orders or license conditions. Once ground-water protection standards have been established pursuant to paragraph 5B(1), the licensee shall establish and implement a compliance monitoring program. The purpose of the compliance monitoring program is to determine that the hazardous constituent concentrations in ground water continue to comply with the standards set by the Commission. In conjunction with a corrective action program, the licensee shall establish and implement a corrective action monitoring program. The purpose of the corrective action monitoring program is to demonstrate the effectiveness of the corrective actions. Any monitoring program required by this paragraph may be based on existing monitoring programs to the extent the existing programs can meet the stated objective for the program.

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Criterion 8—Milling operations must be conducted so that all airborne effluent releases are reduced to levels as low as is reasonably achievable.

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Criterion 8A—Daily inspections of tailings or waste retention systems must be conducted by a qualified engineer or scientist and documented.

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II. Financial Criteria

Criterion 9—(a) Financial surety arrangements must be established by each mill operator before the commencement of operations to assure that sufficient funds will be available to carry out the decontamination and decommissioning of the mill and site and for the reclamation of any tailings or waste disposal areas. The amount of funds to be ensured by such surety arrangements must be based on Commission-approved cost estimates in a Commission-approved plan, or a proposed revision to the plan submitted to the Commission for approval, if the proposed revision contains a higher cost estimate, for:

(1) Decontamination and decommissioning of mill buildings and the milling site to levels which allow unrestricted use of these areas upon decommissioning, and

(2) The reclamation of tailings and/or waste areas in accordance with technical criteria delineated in Section I of this appendix.

(b) Each cost estimate must contain—

(1) A detailed cost estimate for decontamination, decommissioning, and reclamation, in an amount reflecting:
(i) The cost of an independent contractor to perform the decontamination, decommissioning and reclamation activities; and
(ii) An adequate contingency factor;
(2) An estimate of the amount of radioactive contamination in onsite subsurface material;
(3) Identification of and justification for using the key assumptions contained in the DCE; and
(4) A description of the method of assuring funds for decontamination, decommissioning, and reclamation.
(c) The licensee shall submit this plan in conjunction with an environmental report that addresses the expected environmental impacts of the milling operation, decommissioning and tailings reclamation, and evaluates alternatives for mitigating these impacts. The plan must include a signed original of the financial instrument obtained to satisfy the surety arrangement requirements of this criterion (unless a previously submitted and approved financial instrument continues to cover the cost estimate for decommissioning). The surety arrangement must also cover the cost estimate and the payment of the charge for long-term surveillance and control required by Criterion 10 of this section.
(d) To avoid unnecessary duplication and expense, the Commission may accept financial sureties that have been consolidated with financial or surety arrangements established to meet requirements of other Federal or state agencies and/or local governing bodies for decommissioning, decontamination, reclamation, and long-term site surveillance and control, provided such arrangements are considered adequate to satisfy these requirements and that the portion of the surety which covers the decommissioning and reclamation of the mill, mill tailings site and associated areas, and the long-term funding charge is clearly identified and committed for use in accomplishing these activities.
(e) The licensee's surety mechanism will be reviewed annually by the Commission to assure, that sufficient funds would be available for completion of the reclamation plan if the work had to be performed by an independent contractor.
(f) The amount of surety liability should be adjusted to recognize any increases or decreases resulting from:
(1) Inflation;
(2) Changes in engineering plans;
(3) Activities performed;
(4) Spills, leakage or migration of radioactive material producing additional contamination in onsite subsurface material that must be remediated to meet applicable remediation criteria;
(5) Waste inventory increasing above the amount previously estimated;
(6) Waste disposal costs increasing above the amount previously estimated;

(7) Facility modifications;
(8) Changes in authorized possession limits;
(9) Actual remediation costs that exceed the previous cost estimate;
(10) Onsite disposal; and
(11) Any other conditions affecting costs.
(g) Regardless of whether reclamation is phased through the life of the operation or takes place at the end of operations, an appropriate portion of surety liability must be retained until final compliance with the reclamation plan is determined.
(h) The appropriate portion of surety liability retained until final compliance with the reclamation plan is determined will be at least sufficient at all times to cover the costs of decommissioning and reclamation of the areas that are expected to be disturbed before the next license renewal. The term of the surety mechanism must be open ended, unless it can be demonstrated that another arrangement would provide an equivalent level of assurance. This assurance would be provided with a surety instrument which is written for a specified time (e.g., 5 years) and which must be automatically renewed unless the surety notifies the beneficiary (the Commission or the State regulatory agency) and the principal (the licensee) with reasonable time (e.g., 90 days) before the renewal date of their intention not to renew. In such a situation the surety requirement still exists and the licensee would be required to submit an acceptable replacement surety within a brief time to allow at least 60 days for the regulatory agency to collect.
(i) Proof of forfeiture must not be necessary to collect the surety. In the event that the licensee can not provide an acceptable replacement surety within the required time, the surety shall be automatically collected before its expiration. The surety instrument must provide for collection of the full face amount immediately on demand without reduction for any reason, except for trustee fees and expenses provided for in a trust agreement, and that the surety will not refuse to make full payment. The conditions described previously would have to be clearly stated on any surety instrument which is not open-ended, and must be agreed to by all parties. Financial surety arrangements generally acceptable to the Commission are:
(1) Trust funds;
(2) Surety bonds;
(3) Irrevocable letters of credit; and
(4) Combinations of the financial surety arrangements or other types of arrangements as may be approved by the Commission. If a trust is not used, then a standby trust must be set up to receive funds in the event the Commission or State regulatory agency exercises its right to collect the surety. The surety arrangement and the surety or trustee, as applicable, must be acceptable to the Commission. Self insurance, or any arrangement which essentially constitutes self insurance (e.g., a contract with a State or Federal agency), will not satisfy the surety requirement

because this provides no additional assurance other than that which already exists through license requirements.

***

Criterion 10—A minimum charge of $250,000 (1978 dollars) to cover the costs of long-term surveillance must be paid by each mill operator to the general treasury of the United States or to an appropriate State agency prior to the termination of a uranium or thorium mill license.

If site surveillance or control requirements at a particular site are determined, on the basis of a site-specific evaluation, to be significantly greater than those specified in Criterion 12 (e.g., if fencing is determined to be necessary), variance in funding requirements may be specified by the Commission. In any case, the total charge to cover the costs of long-term surveillance must be such that, with an assumed 1 percent annual real interest rate, the collected funds will yield interest in an amount sufficient to cover the annual costs of site surveillance. The total charge will be adjusted annually prior to actual payment to recognize inflation. The inflation rate to be used is that indicated by the change in the Consumer Price Index published by the U.S. Department of Labor, Bureau of Labor Statistics.

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IV. Long-Term Site Surveillance

Criterion 12—The final disposition of tailings, residual radioactive material, or wastes at milling sites should be such that ongoing active maintenance is not necessary to preserve isolation. As a minimum, annual site inspections must be conducted by the government agency responsible for long-term care of the disposal site to confirm its integrity and to determine the need, if any, for maintenance and/or monitoring. Results of the inspections for all the sites under the licensee's jurisdiction will be reported to the Commission annually within 90 days of the last site inspection in that calendar year. Any site where unusual damage or disruption is discovered during the inspection, however, will require a preliminary site inspection report to be submitted within 60 days. On the basis of a site specific evaluation, the Commission may require more frequent site inspections if necessary due to the features of a particular disposal site. In this case, a preliminary inspection report is required to be submitted within 60 days following each inspection.

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V. Hazardous Constituents

Criterion 13—Secondary ground-water protection standards required by Criterion 5 of this appendix are concentration limits for individual

> hazardous constituents. The following list of constituents identifies the constituents for which standards must be set and complied with if the specific constituent is reasonably expected to be in or derived from the byproduct material and has been detected in ground water. For purposes of this appendix, the property of gross alpha activity will be treated as if it is a hazardous constituent. Thus, when setting standards under paragraph 5B(5) of Criterion 5, the Commission will also set a limit for gross alpha activity. The Commission does not consider the following list imposed by 40 CFR Part 192 to be exhaustive and may determine other constituents to be hazardous on a case-by-case basis, independent of those specified by the U.S. Environmental Protection Agency in Part 192.

The foregoing regulations must now be interpreted in light of the Proposed Rules.

Part 51 Regulations

The NRC Regulations at Part 51, particularly Subpart A thereof, are intended to implement NEPA. 10 CFR 51.1; 10 CFR 51.2. Subpart A of Part 51 provides in pertinent part:

> Subpart A--National Environmental Policy Act--Regulations Implementing Section 102(2)
> § 51.10 Purpose and scope of subpart; application of regulations of Council on Environmental Quality.
>
> (a) The National Environmental Policy Act of 1969, as amended (NEPA) directs that, to the fullest extent possible: (1) The policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in NEPA, and (2) all agencies of the Federal Government shall comply with the procedures in section 102(2) of NEPA except where compliance would be inconsistent with other statutory requirements. The regulations in this subpart implement section 102(2) of NEPA in a manner which is consistent with the NRC's domestic licensing and related regulatory authority under the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, and the Uranium Mill Tailings Radiation Control Act of 1978, and which reflects the Commission's announced policy to take account of the regulations of the Council on Environmental Quality published November 29, 1978 (43 FR 55978-56007) voluntarily, subject to certain conditions.

***

(b) The Commission recognizes a continuing obligation to conduct its domestic licensing and related regulatory functions in a manner which is both receptive to environmental concerns and consistent with the Commission's responsibility as an independent regulatory agency for protecting the radiological health and safety of the public. Accordingly, the Commission will:

(1) Examine any future interpretation or change to the Council's NEPA regulations;

(2) Follow the provisions of 40 CFR 1501.5 and 1501.6 relating to lead agencies and cooperating agencies, except that the Commission reserves the right to prepare an independent environmental impact statement whenever the NRC has regulatory jurisdiction over an acitivity [sic] even though the NRC has not been designated as lead agency for preparation of the statement; and

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(c) The regulations in this subpart also address the limitations imposed on NRC's authority and responsibility under the National Environmental Policy Act of 1969, as amended, by the Federal Water Pollution Control Act Amendments of 1972, Pub. L. 92-500, 86 Stat. 816 et seq. (33 U.S.C. 1251 et seq.) In accordance with section 511(c)(2) of the Federal Water Pollution Control Act (86 Stat. 893, 33 U.S.C 1371(c)(2)) the NRC recognizes that responsibility for Federal regulation of nonradiological pollutant discharges into receiving waters rests by statute with the Environmental Protection Agency.

***

NRC Regulations Section 51.20 provides that an EIS - Environmental Impact Statement, with proper scoping and public participation, should be done instead of an Environmental Assessment under certain circumstances:

§ 51.20 Criteria for and identification of licensing and regulatory actions requiring environmental impact statements.

(a) Licensing and regulatory actions requiring an environmental impact statement shall meet at least one of the following criteria:

(1) The proposed action is a major Federal action significantly affecting the quality of the human environment.

(2) The proposed action involves a matter which the Commission, in the exercise of its discretion, has determined should be covered by an environmental impact statement.

(b) The following types of actions require an environmental impact statement or a supplement to an environmental impact statement:

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(8) Issuance of a license to possess and use source material for uranium milling or production of uranium hexafluoride pursuant to part 40 of this chapter.

***

(14) Any other action which the Commission determines is a major Commission action significantly affecting the quality of the human environment. As provided in § 51.22(b), the Commission may, in special circumstances, prepare an environmental impact statement on an action covered by a categorical exclusion. (Emphasis added.)

§ 51.21 Criteria for and identification of licensing and regulatory actions requiring environmental assessments.

All licensing and regulatory actions subject to this subpart require an environmental assessment except those identified in § 51.20(b) as requiring an environmental impact statement, ….

§ 51.22 Criterion for categorical exclusion; identification of licensing and regulatory actions eligible for categorical exclusion or otherwise not requiring environmental review.

(a) Licensing, regulatory, and administrative actions eligible for categorical exclusion shall meet the following criterion: The action belongs to a category of actions which the Commission, by rule or regulation, has declared to be a categorical exclusion, after first finding that the category of actions does not individually or cumulatively have a significant effect on the human environment.

(b) Except in special circumstances, as determined by the Commission upon its own initiative or upon request of any interested person, an environmental assessment or an environmental impact statement is not required for any action within a category of actions included in the list of categorical exclusions set out in paragraph (c) of this section. **Special circumstances include the circumstance where the proposed action involves unresolved conflicts**

concerning alternative uses of available resources within the meaning of section 102(2)(E) of NEPA.[2] (Emphasis added.)

(c) The following categories of actions are categorical exclusions -

***

(14) Issuance, amendment, or renewal of materials licenses issued pursuant to 10 CFR Parts 30, 31, 32, 33, 34, 35, 36, 39, 40 or part 70 authorizing the following types of activities:

….(xiii) Manufacturing or processing of source, byproduct, or special nuclear materials for distribution to other licensees, except processing of source material for extraction of rare earth and other metals.

NRC Regulations 51.30 provides what must be in an Environment Assessment:

§ 51.30 Environmental assessment.

(a) An environmental assessment for proposed actions, other than those for a standard design certification under 10 CFR part 52 or a manufacturing license under part 52, shall identify the proposed action and include:

(1) A brief discussion of:

(i) The need for the proposed action;
(ii) Alternatives as required by section 102(2)(E) of NEPA;
(iii) The environmental impacts of the proposed action and alternatives as appropriate; and

(2) A list of agencies and persons consulted, and identification of sources used.

NRC Regulations Section 51.31 provides that upon completion of an environmental assessment for proposed actions the NRC staff will determine whether to prepare an environmental impact statement or a finding of no significant impact on the

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[2] Section 102(E) of NEPA provides: "[t]he Congress authorizes and directs that, to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act, and (2) all agencies of the Federal Government shall—.…(E) study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." 42 USC 4332.

proposed action. As provided in § 51.33, in this case, a determination to prepare a finding of no significant impact was made.

NRC Regulations § 51.32 provide that a finding of no significant impact made by NRC Staff as in this case must comply with the following:

(1) Identify the proposed action;

(2) State that the Commission has determined not to prepare an environmental impact statement for the proposed action;

(3) Briefly present the reasons why the proposed action will not have a significant effect on the quality of the human environment;

(4) Include the environmental assessment or a summary of the environmental assessment. If the assessment is included, the finding need not repeat any of the discussion in the assessment but may incorporate it by reference;

(5) Note any other related environmental documents; and

(6) State that the finding and any related environmental documents are available for public inspection and where the documents may be inspected.

NRC Regulations Section 51.60 requires that Applicant prepare and submit an environmental report which contains the information specified in NRC Regulations Section 51.45:

§ 51.45 Environmental report

(a) General. As required by §§ 51.50, 51.53, 51.54, 51.55, 51.60, 51.61, 51.62, or 51.68, as appropriate, each applicant or petitioner for rulemaking shall submit with its application or petition for rulemaking one signed original of a separate document entitled "Applicant's" or "Petitioner's Environmental Report," as appropriate. An applicant or petitioner for rulemaking may submit a supplement to an environmental report at any time.

(b) Environmental considerations. The environmental report shall contain a description of the proposed action, a statement of its purposes, a description of the environment affected, and discuss the following considerations:

(1) The impact of the proposed action on the environment. Impacts shall be discussed in proportion to their significance;

(2) Any adverse environmental effects which cannot be avoided should the proposal be implemented;

(3) Alternatives to the proposed action. The discussion of alternatives shall be sufficiently complete to aid the Commission in developing and exploring, pursuant to section 102(2)(E) of NEPA, "appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." To the extent practicable, the environmental impacts of the proposal and the alternatives should be presented in comparative form;

(4) The relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity; and

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

(c) Analysis. The environmental report must include an analysis that considers and balances the environmental effects of the proposed action, the environmental impacts of alternatives to the proposed action, and alternatives available for reducing or avoiding adverse environmental effects. An environmental report required for materials licenses under § 51.60 must also include a description of those site preparation activities excluded from the definition of construction under § 51.4 which have been or will be undertaken at the proposed site (i.e., those activities listed in paragraphs (2)(i) and (2)(ii) in the definition of construction contained in § 51.4); a description of the impacts of such excluded site preparation activities; and an analysis of the cumulative impacts of the proposed action when added to the impacts of such excluded site preparation activities on the human environment. An environmental report prepared at the early site permit stage under § 51.50(b), limited work authorization stage under § 51.49, construction permit stage under § 51.50(a), or combined license stage under § 51.50(c) must include a description of impacts of the preconstruction activities performed by the applicant at the proposed site (i.e., those activities listed in paragraph (1)(ii) in the definition of "construction" contained in § 51.4), necessary to support the construction and operation of the facility which is the subject of the early site permit, limited work authorization, construction permit, or combined license application. The environmental report must also contain an analysis of the cumulative impacts of the activities to be authorized by the limited work authorization, construction permit, or combined license in light of the preconstruction impacts described in the environmental report. Except for an environmental report prepared at the early site permit stage, or an environmental report prepared at the license renewal stage under § 51.53(c), the analysis in the environmental report should also include consideration of the economic, technical, and other benefits and costs of the proposed action and its alternatives. Environmental reports prepared at the license renewal stage under § 51.53(c) need not discuss the economic or technical benefits and costs of either the proposed action or alternatives except if these benefits and

costs are either essential for a determination regarding the inclusion of an alternative in the range of alternatives considered or relevant to mitigation. In addition, environmental reports prepared under § 51.53(c) need not discuss issues not related to the environmental effects of the proposed action and its alternatives. The analyses for environmental reports shall, to the fullest extent practicable, quantify the various factors considered. To the extent that there are important qualitative considerations or factors that cannot be quantified, those considerations or factors shall be discussed in qualitative terms. The environmental report should contain sufficient data to aid the Commission in its development of an independent analysis.

(d) Status of compliance. The environmental report shall list all Federal permits, licenses, approvals and other entitlements which must be obtained in connection with the proposed action and shall describe the status of compliance with these requirements. The environmental report shall also include a discussion of the status of compliance with applicable environmental quality standards and requirements including, but not limited to, applicable zoning and land-use regulations, and thermal and other water pollution limitations or requirements which have been imposed by Federal, State, regional, and local agencies having responsibility for environmental protection. The discussion of alternatives in the report shall include a discussion of whether the alternatives will comply with such applicable environmental quality standards and requirements.

(e) Adverse information. The information submitted pursuant to paragraphs (b) through (d) of this section should not be confined to information supporting the proposed action but should also include adverse information.

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PROPOSED CONTENTIONS

FINANCIAL, DECOMMISSIONING & EIS BASED CONTENTIONS

The License Renewal Application (combined Technical Report and Environmental Report, November 2007) ("LRA"), Safety Evaluation Report (August 2014) ("SER") and Final Environmental Assessment (October 2014) ("Final EA"), in light of the Proposed Rules, each fails to meet the requirements of the AEA, as amended, the Uranium Mill Tailings Radiation Control Act of 1978 ("UMTRCA"), and the National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4231, *et seq.*, and

implementing regulations, including NRC regulations in 10 CFR Part 40, Appendix A to Part 40, and 10 C.F.R. Part 51, because the LRA, the SER and the Final EA do not provide analyses that are adequate, accurate, and complete in all material respects to (i) describe the affected area and environment (10 CFR 51.45; 51.60; 51.71); (ii) describe cumulative impacts, mitigation measures, and consider reasonable alternatives (10 CFR 51.10; 51.71; 51.60); (iii) demonstrate that Crow Butte's proposed equipment, facilities and procedures are adequate to protect health and minimize danger to life or property; and the issuance of the license will not be inimical to the common defense and security or to the health and safety of the public, in accordance with 10 CFR 40.32(c)(d), (iv) demonstrate that Crow Butte's groundwater monitoring for for pre-operations, operations and post-operational restoration and decommissioning is in compliance with the Proposed Rules; (v) demonstrate that Crow Butte's financial assurances in accordance with Appendix A to Part 40, 10 CFR 40.36, 40.31(i), in light of the long-term stability monitoring (up to 30 years) imposed by the Proposed Rules and in light of the difficulty in meeting the Proposed Rules new standards; (vi) describe and consider the reasonable alternative of decommissioning Crow Butte's mine operations since it has been effectively engaged in restoration activities and it had planned to cease commercial production in 2014, which has now passed.

As required by 10 C.F.R. § 2.309, the Consolidated Intervenors set forth below specific new contentions based on the Proposed Regulations. Each contention raises issues with respect to the sufficiency of the LRA, SER and/or Final EA under applicable law and regulations, as they would be modified assuming the Proposed Rules take effect in the current form published for comment.

The Proposed Rules state at Section II.E.1:

> Long-term environmental impacts may result if restoration processes do not return aquifers to their preoperational state, or if restored levels do not persist over time and groundwater degrades through the slow release of residual contaminants. Most ISR sites historically have been unable to meet restoration goals for all constituents even after extensive effort. (22) Because the past practice of monitoring after restoration has typically been for a very limited time period, we do not know if the goals that are met for the short-term are maintained for a longer time.
>
> **The restoration process itself is extremely complex and difficult to control.** The fact that significant quantities of uranium and other constituents have been removed from the natural setting may affect flow patterns and create discontinuities that further complicate or retard the restoration process. Originally, uranium was precipitated from groundwater moving through pore spaces in the host medium, which altered the flow paths on a local level throughout the deposit as the deposition of uranium continued and changed the porosity and permeability of the host medium. **Once uranium extraction processes begin, fluids are pumped into the deposit to mobilize the precipitated uranium and remove it; the porosity and permeability of the host rock are also affected.** Because the uranium is not initially distributed evenly throughout the deposit (because of the natural variations in the host rock properties), the extraction process cannot be assumed to remove all of the uranium; in fact, it does not. **The restoration process likewise cannot be assumed to fully restore the porosity and permeability characteristics of the host rock to the exact conditions that existed before the ISR operations began. These changes in hydrologic properties in the host rock during extraction and restoration processes can have the net effect of altering flow paths within the deposit on a local level. Such largely unavoidable, incomplete restoration efforts may result in pockets of slowly leaching contaminants that may migrate out of the production zone over time. (Emphasis added.)**

Based on the foregoing, Consolidated Intervenors hereby submit the following new contentions based on the Proposed Rules:

Contention F1: Failures Concerning Financial Assurances

The LRA, SER and Final EA fail to meet the requirements of the AEA, NEPA, Part 40, Appendix A to Part 40, and Part 51 and CEQ regulations because each lacks an adequate description of adequate financial assurances sufficient to ensure the payment of the costs of restoration and long-term monitoring of up to 30 years under the Proposed Rules.

Basis and Discussion:

10 C.F.R. §§ 51.10, 51.70 and 51.71, and the National Environmental Policy Act, and implementing regulations, require a description of the affected environment containing sufficient data to aid the Commission in its conduct of an independent analysis. Further, 10 C.F.R. Part 40, Appendix A, criterion 9 requires the applicant to provide financial assurances. NRC Regulations Sections 40.31(h) and 40.36 require a showing by applicant in the LRA of how the requirements and objectives set forth in Appendix A have been addressed. Since the LRA was submitted in 2007 and does not reflect the Proposed Rules, it omits to incorporate the new requirements and costs related to compliance with the Proposed Rules. NRC Regulations Section 40.31(i) requires applicant to include in the LRA a proposed decommissioning funding plan or a certification of financial assurance for decommissioning. NRC Regulations Section 40.36 makes Appendix A to Part 40 applicable to the instant case.

Appendix A to Part 40 implicates " the standards promulgated by the Environmental Protection Agency in 40 CFR Part 192, Subparts D and E" Appendix A to Part 40. Further Criterion 5 of Appendix A provides:

> Criterion 5—Criteria 5A-5D and new Criterion 13 incorporate the basic ground-water protection standards imposed by the Environmental

> Protection Agency in 40 CFR Part 192, Subparts D and E (48 FR 45926; October 7, 1983) which apply during operations and prior to the end of closure. Ground-water monitoring to comply with these standards is required by Criterion 7A.

Accordingly, the Proposed Rules will apply to Crow Butte's operations once finalized, published and made effective in accordance with applicable law. Further, Criterion 7 is implicated by the Proposed Rules because it involves an operational monitoring program but the nature and extent, and cost, of such program has now changed under the Proposed Rules.

Section II, Criterion 9 and Criterion 10 deal with financial assurances and increasing the same based on long-term costs for site-surveillance or control requirements. These provide for financial surety arrangements to assure that "sufficient funds will be available to carry out the decontamination and decommissioning of the mill and site and for the reclamation of any tailings or waste disposal areas." Appendix A, Criterion 9. Criterion 9 also includes detailed regulations for estimating costs of restoration and decommissioning. In the case of Crow Butte, the cost of restoration and decommissioning depends on the number of pore volumes required to achieve the regulatory standards then in effect.

The current financial surety for Crow Butte is described in the LRA (Section 6.6), and the SER (Section 6.5, p.152), to have been based on the number of pore volumes originally estimated by Crow Butte under old restoration standards that are no longer applicable such as 'class-of-use' and others that have been abandoned by the NRC, by Crow Butte and the EPA, as reflected by the

Proposed Rules. The only changes in the amount of the irrevocable line of credit issued by Royal Bank of Canada (New York Branch) has been for 'cost-of-living'/inflation increases. There have been no increases for the increased costs of restorations in light of the extended time period and larger-than-expected number of pore volumes (in the case of MU-1, 34 pore volumes, and an unknown amount of water in the case of MU-2 to MU-6 currently in 'restoration'; and MU-7 to MU-11 which are schedule to go into restoration starting in 2015 according to the Final EA.

There has been no increase in the amount of financial surety to reflect the increased costs of stability and long-term monitoring required by the Proposed Rules.

Further, in light of the $1.5 Billion tax charge levied by Canadian Revenue Agency and the $32 Million tax charge levied by the Internal Revenue Service (for one (1) year with an additional three (3) years also under audit and likely to result in like amounts of levies) for basically parking profits in low-tax Switzerland to the detriment of Canadian and American tax collectors, Cameco and its Crow Butte subsidiary are facing what some estimate is a 27%-52% chance of going bankrupt according to stock market commentators. See "Will Cameo Corporation Go Bankrupt?" (The Motley Fool Canada, February 19, 2015), attached hereto as Exhibit A; and "IRS targets uranium producer Cameco as CRA tax dispute intensifies" (Financial Post, February 9, 2015), attached as Exhibit B hereto.

Under Section 40.9, Crow Butte was required to notify the NRC Staff in writing that it is under Canadian and US tax enforcement actions over $1.62 Billion and that an adverse ruling would significantly impact its ability to continue as a going concern.

In addition to the financial strains put on Crow Butte by the Cameco tax actions and the low uranium market prices would be the additional $1.50/lb[3] cost to be added by the Proposed Regulations. According to Cameco's Financial Statements published with its most recent annual report, the Crow Butte mine at Crawford is currently producing about 600,000 lbs of U308. So, an additional $1.50/lb would represent $900,000 per year in costs just from the Proposed Rules. Further, if additional monitoring is required due to the new porosity, secondary porosity, changes in permanence, etc., caused by the mine's operations, these costs could be well in excess of $900,000 per year at current production rates and up to $1.5 million per year at the production rate of 1 million pounds per year described in the LRA.

Over the ten-year period of the new license, this would represent an amount of at least $9 million and as much as $15 million to be added to the amount of the irrevocable letter of credit which currently stands at approximately $28 million. Accordingly, at the high end, the amount that must be fully funded would increase by a factor of 50% more under the Proposed Rules.

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[3] Proposed Rules, Section V.C.

Neither Section 6.6 of the LRA nor Section 6.5 of the SER contemplate this potential liability and insecurity with regard to restoration costs. Based on this, this contention should be admitted.

Contention F2: Crow Butte Is Now In Restoration Per Its Plans

The Final EA fails to meet the requirements of the AEA, NEPA, Part 40, Appendix A to Part 40, and Part 51 and CEQ regulations because it fails to describe that Crow Butte has or will soon cease production and move into restoration and decommissioning.

Basis and Discussion:

10 C.F.R. §§ 51.10, 51.70 and 51.71, and the National Environmental Policy Act, the AEA, Appendix A to Part 40 and Part 40, and implementing regulations, require that the SER and Final EA accurately describe Crow Butte's activities and that Crow Butte follow its restoration and decommissioning schedule. Since Crow Butte expects to be completing production or has completed production already at the end of 2014, it is reasonable to suggest that it has moved into restoration and decommissioning already.

SER 6.1.3.6 provides:

> 6.1.3.6 Restoration Schedule The applicant stated in Section 1.7 of the application that the production at the CBR facility is expected to be completed by 2014 and restoration completed by 2023 (CBR, 2007). While NRC has no regulations which specify the time in which restoration must be completed, the applicant was informed by NRC that is required to meet the requirements in 10 CFR 40.42(h)(1) which states the applicant must complete decommissioning within 24 months of initiating decommissioning or submit an alternate schedule for decommissioning for NRC review and approval in accordance with 10 CFR 40.42(i) (NRC, 2008). For an ISR, NRC defines that decommissioning begins when the applicant permanently ceases the injection of lixiviant in a wellfield

(NRC, 2008). NRC notes that in the September 2009 inspection report, the applicant received a Security Level IV violation for its failure to request an alternate decommissioning schedule for Mine Units 2-5 (NRC, 2009a). The applicant was cited for failing to meet the requirements in 10 CFR 40.42 which required the applicant to complete decommissioning 24 months after the cessation of lixiviant into these mine units or submit an alternate schedule for decommissioning for NRC review and approval. On July 24, 2009, to address this violation, the applicant requested an alternate schedule for restoration of Mine Units 2 through 5 (CBR, 2009). The alternate schedule indicated that the restoration including regulatory approval should be completed by July 2012, July 2013, Jan. 2015 and July 2016 for Mine Unit 2, 3, 4 and 5, respectively. The alternate schedule was approved by NRC (NRC, 2010a) and the inspection issue was closed. In December 2010, the applicant provided NRC with notification of the cessation of lixiviant injection in Mine Unit 6. NRC considers this action to be the starting point of decommissioning for an ISR wellfield. The applicant also provided a restoration plan and alternate schedule for decommissioning for Mine Unit 6 (CBR, 2010). This request for an alternate schedule is currently under review by NRC staff. The alternate schedule indicated that the restoration for Mine Unit 6 should be completed by Dec. 31, 2019. Apart from staff's review of the above referenced request for an alternate schedule, NRC staff finds that the applicant's schedule for restoration (CBR, 2007) is acceptable and meets the regulatory requirements.

Based on the foregoing, the NRC Staff made its evaluations in SER 6.1.4 that:

6.1.4 Evaluation Findings Based on the information provided in the license renewal application as coupled with the corresponding detailed review by the NRC staff of the applicant's plans and schedules for ground water quality restoration at the Crow Butte ISR facility, the staff concludes that the applicant's plans and schedules for ground water quality restoration are in compliance with 10 CFR 40.32(c), requiring the applicant's proposed equipment, facilities, and procedures to be adequate to protect health and minimize danger to life or property. However, as previously discussed, to ensure the applicant: (1) meets the restoration standards for groundwater quality which are covered listed in Criterion 5B(5) of Appendix A in 10 CFR Part 40, (2) conducts an acceptable baseline water quality assessment, and (3) performs sufficient restoration stability monitoring, the NRC staff determined that the following license conditions are necessary: …

The Proposed Rules (Section D) note that:

The potential for excursions may also be a factor in the facility's decision to stop operations and enter the restoration phase. In some cases, conventional mills may

> enter a standby period, in which they stop processing ore with the intent to resume operations at some point in the future (the price of uranium is often the decisive factor in these decisions). In some cases, mills have remained on standby for years at a time. **For an ISR facility, however, such a "standby" period is inappropriate because the migration of constituents mobilized by the prior injection of lixiviant continues even if the decision is made to stop extracting uranium. Excursions beyond the production zone are more likely to occur if the gradient within the wellfield is not maintained. In our view, stopping the extraction cycle must be interpreted as an end to the operational phase and should trigger initiation of the restoration phase.**

Based on the foregoing, as of 2010, MU-2 to MU-6 have ceased production. It is expected that as of the end of 2014, production has completed. Pursuant to the EPA's interpretation above, standby is inappropriate for the Crow Butte mine. Therefore, now that the extraction cycle has ceased, there has occurred an end of the operational phase and this should trigger initiation of the restoration phase for MU-7 to MU-11. Since Crow Butte has not restored any more mining units, and in light of the Proposed Rules and the trouble with the monitoring wells in MU-1 (3 of which have been on excursion for thousands of days, many years!), it is likely that under the Proposed Rules there will be substantial and long-term stability monitoring and long-term monitoring that will require further work on MU-1 and will extend the restoration schedules substantially due to the Proposed Rules. Accordingly, it has become highly unlikely due to the Proposed Rules that Crow Butte will ever commence productions on MU-12, or others at the original Licensed Area.

NRC Regulations 40.42 provides for decommissioning, in pertinent part, that:

> (d) Within 60 days of the occurrence of any of the following, consistent with the administrative directions in § 40.5, each licensee shall provide

> notification to the NRC in writing and either begin decommissioning its site, …or submit within 12 months of notification a decommissioning plan, if required by paragraph (g)(1) of this section, and begin decommissioning upon approval of that plan if--
> ***
> (2) The licensee has decided to permanently cease principal activities, as defined in this part, at the entire site or in any separate building or outdoor area; or
> (3) No principal activities under the license have been conducted for a period of 24 months…

Consolidated Intervenors assert that Crow Butte has decided to permanently cease "Principal Activities" which include only production and not restoration. As a result, Crow Butte should notify the Commission that it is either beginning to decommission or submit a decommissioning plan pursuant to Section 40.42(d). Further, as provided by Section 40.42(e), (g)(4)(v), Crow Butte must submit an updated detailed cost estimate for decommissioning, comparison of that estimate with present funds set aside for decommissioning, and a plan for assuring the availability of adequate funds for completion of decommissioning. This is even more important in light of the probability of increased decommissioning costs than currently anticipated due to the Proposed Regulations and in light of the percentage probability of Cameco's bankruptcy due to the Canadian and IRS tax enforcement actions.

Based on the foregoing, this contention should be admitted.

Contention F3: Failure of the NRC Staff to do EIS, Scoping Instead of EA

The Final EA fails to meet the requirements of the AEA, NEPA, Part 40, Appendix A to Part 40, and Part 51 and CEQ regulations because it is not an EIS

as required because of the special circumstances in this case under the Proposed Rules. The Final EA fails to satisfy the NRC's requirement for an EIS when there are unresolved conflicts concerning reasonable alternatives under Section 102(E) of NEPA.

Basis and Discussion:

10 C.F.R. §§ 51.10, 51.70 and 51.71, and the National Environmental Policy Act, and implementing regulations, require consideration of reasonable alternatives to the proposed action. Reference is made to SER 6.1.3.6 and SER 6.1.4; both of the foregoing sections of the SER are modified by the Proposed Rules. Further, the information in these sections needs to be reviewed in light of the Proposed Rules requirements for 3-year stability and for long-term monitoring under Subpart F; Regulations Sections 192.53(d), 192.53(e). In light of the larger than previously known water commitments, the new porosity and permeability changes in the mining units and, perhaps beyond, the increased difficulty to come from the Proposed Regulations in meeting restoration goals, including the need to work harder before seeking an alternate, as set forth below, an EIS should be prepared:

> The regulatory agency may face situations in which the operator will request ACLs. **If after extensive effort** the operator determines that the initial restoration goals for one or more constituents cannot be achieved as required in the license, the operator may request and the regulatory agency may approve the levels that have been achieved as provisional ACLs and determine that restoration is complete (i.e., that there is no statistically significant trend in the concentrations of regulated species over time). Then, the operator may request and the regulatory agency may approve final ACLs if post-restoration monitoring indicates three consecutive years of stability at the 95 percent confidence level. The

approval of final ACLs, however, would not by itself satisfy the requirements for long-term stability monitoring.

NRC Regulations Section 51.20 describes when an EIS should be done, as described in the Applicable Law section herein above. The License renewal, especially in light of the Proposed Rules, is a major federal action "significantly affecting the quality of the human environment." Further, the proposed action involves a matter which the Commission, in the exercise of its discretion, has determined should be covered by an environmental impact statement because of the special circumstances of unresolved conflicts concerning reasonable alternatives which constitutes special circumstances. As a result, even though only one is required, both of the criteria of 51.20 are met. Section 51.20(b)(8) states that the issuance of a source materials license under Part 40 requires an EIS. Because this is a license renewal, Section 51.20(b)(8) does not on its face apply.

Section 51.20(b)(14) provides that and EIS shall be done when:

(14) Any other action which the Commission determines is a major Commission action significantly affecting the quality of the human environment. As provided in § 51.22(b), the Commission may, in special circumstances, prepare an environmental impact statement on an action covered by a categorical exclusion. (Emphasis added.)

Under Section 51.22(c)(14), there may exist a categorical exclusion for the renewal of a source materials license such as the one at issue in this case, authorizing (xiii) [m]anufacturing or processing of source, byproduct, or special nuclear materials for distribution to other licensees, except processing of source material for extraction of rare earth and other metals." 10 CFR 51.22(c)(14)(xiii).

However, there is an exception found in Section 51.22(b) which provides:

> Except in special circumstances, as determined by the Commission upon its own initiative or upon request of any interested person, an environmental assessment or an environmental impact statement is not required for any action within a category of actions included in the list of categorical exclusions set out in paragraph (c) of this section. **Special circumstances include the circumstance where the proposed action involves unresolved conflicts concerning alternative uses of available resources within the meaning of section 102(2)(E) of NEPA**.[4] (Emphasis added.)

Since Consolidated Intervenors have asserted that the NRC Staff has failed to consider all reasonable alternatives, including the alternative of simply allowing Crow Butte to commence the decommissioning that it has already scheduled itself to be on as of 2015, there exist special circumstances in this case justifying an EIS. These special circumstances are enhanced by the extremely complex nature of aquifer restoration, as described by the EPA in the Proposed Rules, and also by the difficulty in statistical analyses and stability and long-term monitoring required under the Proposed Rules. All these demand that an EIS, with proper scoping, DSEIS and FSEIS be prepared and published for commentary, in accordance with NEPA.

Based on the foregoing, this contention should be admitted.

EA BASED CONTENTIONS

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[4] Section 102(E) of NEPA provides: "[t]he Congress authorizes and directs that, to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act, and (2) all agencies of the Federal Government shall—.…(E) study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." 42 USC 4332.

CONTENTION F4: The Environmental Assessment Fails to Adequately Describe and Analyze Aquifer Restoration Goals in Light of New Standards for Determining Alternative Control Limits in the Proposed Rules

The Consolidated Intervenors note that § 192.52 of the Proposed Rules exempts from compliance those wellfields in restoration, stability monitoring or long-term monitoring when the final regulations take effect. 80 Fed. Reg. at 4185. Accordingly these comments only relate to Mine Units 7-11. However the real world experience derived from the attempts at restoration of Mine Unit 1 extensively detailed by Consolidated Intervenors in previous pleadings serves to inform future expectations.

Even if the baseline values used by CBR and NRC Staff to calculate the restoration goals for the license area were sufficiently detailed to inform accurate post-operational restoration values, the restoration procedures accepted in the Environmental Assessment are likely to be insufficient to meet the more stringent requirements under the Proposed Rules.

As CBR candidly admitted regarding Mine Unit 1, their attempt at restoration, including more than 36 pore volumes, "proceeded beyond the point where significant improvement was possible with continuing treatment." CBR letter to NRC dated August 24, 2001 at p 9 ML010120424. This was the result under standards less stringent than those in the Proposed Rules.

The Environmental Assessment fails to describe and analyze the environmental impacts, specifically related to water consumption, long term stability monitoring and Alternative Control Limit determinations that are impacted by the Proposed Rules and the attendant 30-year monitoring protocol. The finding of no significant impact for the

restoration effort cannot be supported given the new regulatory requirements. Accordingly, a full Environmental Impact Statement must be prepared that adequately describes and analyzes the potential impacts of the Proposed Rules.

CONTENTION F5: The Environmental Assessment, License Renewal Application and Associated Monitoring Values and Restoration Goals Rely on Baseline Data Calculations that are Inadequate and Unacceptable Under the Proposed Rules

In the Proposed Rules, the EPA identifies several concerns about the manner in which the uranium mining industry has determined, and the NRC has accepted, baseline characterizations. The Proposed Rules specify detailed procedures for establishing baseline values and require a minimum monitoring period of one year in order to develop an accurate picture of the groundwater characteristics prior to the commencement of mining activities. 80 Fed. Reg. at 4186.

In formulating the Proposed Rules, the EPA sought advice from the Radiation Advisory Committee of its Science Advisory Board ("RAC"). In its discussion of the Proposed Rules, the EPA describes the advice it received.

> Among the more prominent RAC recommendations are the following:
>
> Identify indicators, both chemical and radioactive, for establishing conditions pre- and post-operationally, not limited to those with regulatory limits, but also including non hazardous constituents that can affect the behavior of, or serve as surrogates for, constituents of interest;
>
> Devote at least as much effort to defining background groundwater conditions as to post operational trend monitoring;
>
> Consider challenging and fluctuating ambient circumstances in background characterization;
>
> Build in flexibility to modify the design and implementation of monitoring programs as new information becomes available;
>
> Carefully qualify the meaning of "return to preoperational groundwater

> quality";
>
> Match sampling frequency and duration to information needs for hydrogeologic model confirmation;
>
> Present a survey of methods to determine sufficient well number and density; and
>
> Select statistical evaluation approach in terms of strengths and weaknesses to suit questions to be answered.

80 Fed. Reg. at 4167. All of these "prominent" recommendations from the RAC apply to the collection of accurate baseline data and the integration of that data into meaningful monitoring values and post-operational restoration goals.

Additionally, the Proposed Rules require the baseline values to account for the impacts to the groundwater of the monitoring wells themselves. The EPA explains:

> Today's proposal also specifies that the preoperational groundwater monitoring program must account for the effects of well installation and development on the groundwater characteristics. The physical act of penetrating the aquifer to install the well can cause localized changes in constituent concentrations or chemical parameters, which can lead to a misleading picture of background conditions. This can, in turn, result in selection of artificially high restoration goals.

80 Fed. Reg. at 4174. These concerns are virtually identical to those raised by the Consolidated Intervenors' expert, Dr. Abitz in his 2008 opinion letter attached to the initial Petition for Intervention, where he stated,

> Section 2.9 notes that a preoperational monitoring was conducted for nonradiological parameters. This is unacceptable. Uranium and radium must also be considered because exploration holes placed in the ore zone disturb the ore and create a path for oxygen. The disturbance of the ore will expose new uranium mineral surfaces to the groundwater, which will release additional uranium, radium and their progeny. Addition of oxygen to the disturbed region will increase the dissolution of uranium ore minerals.

Abitz Opinion at 9. These procedures were not employed when the CBR facility was initially licensed in 1987.

Since that time, the CBR mining facility has operated, and continues to operate, in an information vacuum devoid of an accurate picture of what baseline groundwater conditions existed prior to mining. While the Consolidated Intervenors acknowledge that it is now impossible to go back in time and collect statistically adequate and accurate baseline data, the impacts of that deficiency must still be addressed. Because the baseline data on which both the monitoring standards and the restoration goals for the facility are based is insufficient under the framework described in the Proposed Rules, there can be no basis for NRC Staff's conclusion that the license renewal will result in no significant impact.

The lack of accurate baseline data, whether due to intentionally skewed findings at the preoperational stage or not, requires, at a minimum, the preparation of a full EIS to determine how to characterize and evaluate the impacts the continued operation of the CBR facility.

CONTENTION F6: The Environmental Assessment Fails to Describe and Analyze the Environmental Impacts of New Porosity and Permeability in the Aquifer Caused by Mining Activity

In discussing the need for the long term monitoring protocols derived from RCRA in the Proposed Rules, the EPA explains some of the environmental impacts that result from the in situ leach mining of uranium:

> The alteration of large subsurface areas through injection of chemical solutions also has the potential to cause changes in groundwater at significant distances downgradient.
>
> * * *
>
> Once uranium extraction processes begin, fluids are pumped into the deposit to mobilize the precipitated uranium and remove it; the porosity and permeability of the host rock are also affected.
>
> * * *
>
> The restoration process likewise cannot be assumed to fully restore the porosity and permeability characteristics of the host rock to the exact conditions that existed before the ISR operations began.

80 Fed. Reg. at 4164-5. Here the Proposed Rules echo certain concerns raised early in these proceedings by the Consolidated Intervenors' expert Dr. LaGarry.

As described by Dr. LaGarry in his July, 2008 opinion letter:

> If there are minerals along the faults and CBR is mining them, then they (CBR) are progressively "uncorking" the flow pathways along these faults. If this is the true situation, the risk of spilling contaminants into these faults increases with additional mining, and contamination by chemically altered waters is a virtual certainty. Also, mining the Chamberlain Pass Formation could cause these faults to move again. This could create new, unforeseen pathways for contaminants to(sic) spread through.

Dr. LaGarry Opinion July 2008 at p 3-4. Despite Dr. LaGarry's concerns and the seven intervening years, the Environmental Assessment does not describe and analyze the existence, let alone the potential impacts, of the new porosity pathways and permeability identified in the discussion of the Proposed Rules.

The Consolidated Intervenors posit that these new porosity pathways could be one of the reasons why restoration at the CBR site is proving so challenging. Without a description and analysis of the underground features that are altered by in situ leach

mining, the NRC Staff's finding of no significant impact is meaningless and must be rejected. These new potential contaminant pathways, first identified by Dr. LaGarry and now confirmed in the Proposed Rules mandate an Environmental Impact Statement to assess the environmental impacts of the continued licensing and operation of the CBR facility.

CONTENTION F7: The Environmental Assessment Fails to Adequately Describe and Analyze the Impacts of Maintaining Post-Operational Wellfields as Long Term Hazardous Waste Facilities

In the Proposed Rules, the EPA adopts the hazardous waste control standards found in the Resource Conservation and Recovery Act ("RCRA"). 80 Fed. Reg. at 4169. In its discussion, the EPA notes:

> The behavior of the restored wellfield in the long-term, *i.e.,* decades or longer after the ISR operations end, has not been examined.
>
> We believe that only a combination of longer stability monitoring and geochemical modeling using site-specific data can provide confidence that the ISR site poses no long-term hazards, and we are proposing such provisions today.

Id.

The EPA's decision to apply RCRA standards belies CBR's and NRC Staff's descriptions of aquifer "restoration." The best post-operational scenario that can reasonably be expected is long term monitoring of aquifers that are more accurately characterized as hazardous waste management facilities. It is also noteworthy that pending the insolvency of CBR, the long term management of these post-operational wellfields will have to be managed as Superfund sites.

The Environmental Assessment does not describe these long term monitoring requirements and accordingly cannot analyze what impact these requirements will have on the environment. Accordingly, an Environmental Impact Statement must be prepared.

Contention F8: Failure to Consider All Reasonable Alternatives

Under NEPA, an agency is required to consider all reasonable alternatives as required by 10 C.F.R. §§ 51.10, 51.70 and 51.71, and the National Environmental Policy Act, and implementing regulations.

Basis and Discussion:

The range of alternatives is "the heart of the environmental impact statement." 40 C.F.R. § 1502.14. See also, 40 C.F.R. Part 51, Appendix A to Subpart A (5) (acknowledging that consideration of alternatives "is the heart of the environmental impact statement"). NEPA requires agencies to "rigorously explore and objectively evaluate" a range of alternatives to proposed federal actions. See 40 C.F.R. §§ 1502.14(a) and 1508.25(c). "An agency must look at every reasonable alternative." *Northwest Envtl. Defense Center v. Bonneville Power Admin.*, 117 F.3d 1520, 1538 (9th Cir. 1997). See also, 40 C.F.R. Part 51, Appendix A to Subpart A (5) (acknowledging that "All reasonable alternatives will be identified."). An agency violates NEPA by failing to "rigorously explore and objectively evaluate all reasonable alternatives" to the proposed action. *City of Tenakee Springs v. Clough*, 915 F.2d 1308, 1310 (9th Cir. 1990) (quoting 40 C.F.R. § 1502.14). This evaluation extends to considering more environmentally

protective alternatives and mitigation measures. See e.g., *Kootenai Tribe of Idaho v. Veneman*, 313 F.3d 1094, 1122-1123 (9th Cir. 2002) (and cases cited therein).

NEPA requires that an actual "range" of alternatives be considered, so that the Act will "preclude agencies from defining the objectives of their actions in terms so unreasonably narrow that they can be accomplished by only one alternative (i.e. the applicant's proposed project)." *Colorado Envtl. Coalition v. Dombeck*, 185 F.3d 1162, 1174 (10th Cir. 1999), citing *Simmons v. United States Corps of Engineers*, 120 F.3d 664, 669 (7th Cir. 1997). This requirement prevents the EIS from becoming "a foreordained formality." *City of New York v. Department of Transp.*, 715 F.2d 732, 743 (2nd Cir. 1983). See also *Davis v. Mineta*, 302 F.3d 1104 (10th Cir. 2002).

Numerous unexplored and unreviewed alternatives exist, especially including those set forth by the EPA in the Proposed Rules. As stated by the EPA in the commentary to the Proposed Rules, there is no 'standby' and once production ceases, decommissioning should be triggered. Further, decommissioning of Crow Butte's operations at Crawford, NE is contemplated to occur imminently as described in Contention F2 above because it shall have ceased production in 2014 according to the LRA, SER and Final EA.

Based on the foregoing, there is new information from the EPA Proposed Rules to challenge the Final EA's description of reasonable alternatives in the Final EA, including Section 1.5 thereof, which provides:

> 1.5 Alternatives to the Proposed Action 1.5.1 No-Action Alternative
>
> The no-action alternative would consist of denial of CBR's request to renew the license. Decommissioning of the CBR facility would commence upon

> NRC approval of the final decommissioning plan in accordance with 10 CFR Part 40.42. NRC approval of a final decommissioning plan would constitute a federal action under NEPA and would be subject to a site-specific environmental review. Potential environmental impacts associated with decommissioning the CBR facility would be similar to those described for decommissioning following the proposed action in Chapter 4 of this EA.
>
> Additionally, the no-action alternative would have a negative impact on current and future satellite facility applications by CBR Inc. If the renewal of the CBR facility were not approved, the satellite expansions would be impacted because these proposed facilities plan on using the central processing plant and building offices currently located at the CBR facility.

***

> 4.6.3 No-Action Alternative
>
> If the renewal of the license is not granted, decommissioning of the CBR facility would commence upon NRC approval of the final decommissioning plan in accordance with 10 CFR Part 40.42. NRC approval of a final decommissioning plan would constitute a federal action under NEPA and would be subject to a site-specific environmental review. Potential impacts on water resources associated with decommissioning activities on the CBR facility as discussed in Section 4.6 of this EA are expected to be SMALL.

***

Consolidated Intervenors submit that under the Proposed Rules, the restoration and decommissioning process and related monitoring requirements could create long-term employment opportunities during the stability and up to 30-year long-term monitoring periods that are not described in Section 1.5 of the Final EA and should be described after complete analysis, in the Final EA as a result of the Proposed Rules.

The failure to consider these alternatives violates NEPA and, accordingly, this contention should be admitted.

Contention F9: Failure to Take a Hard Look at Impacts Related to Restoration Standards and Alternate Standards Due to NRC Staff 'Cozy' Relationship With Industry Compared to EPA

The Final EA violates 10 C.F.R. §§ 51.10, 51.70, 51.71, the National Environmental Policy Act and implementing regulations, by failing to conduct the required "hard look" analysis at impacts of the proposed mine associated with restoration standards, difficulty and cost in achieving the same and the use of the alternative standards permitted under the Proposed Rules, especially in light of and due to the 'cozy' relationship between NRC Staff and Industry compared to EPA as evidenced by the Proposed Regulations.

Basis and Discussion:

NEPA "prevent[s] or eliminate[s] damage to the environment and biosphere by focusing government and public attention on the environmental effects of proposed agency action." *Marsh v. Oregon Natural Resources Council*, 490 U.S. 360, 371 (1989). It requires the federal agency to ensure "that the agency will inform the public that it has indeed considered environmental concerns in its decision making process." *Baltimore Gas and Electric Company v. NRDC*, 462 U.S. 87, 97 (1983). Federal courts have ruled that in the mining context specifically, "[w]e must also ensure that the agency took a hard look at the environmental consequences of its action." *Great Basin Mine Watch v. Hankins*, 456 F.3d 955, 962 (9th Cir. 2006).

NEPA's analysis and disclosure goals are two-fold: (1) to insure that the agency has carefully and fully contemplated the environmental effects of its action, and (2) "to insure that the public has sufficient information to challenge the agency." *Robertson v.*

Methow Valley Citizens Council, 490 U.S. 332, 349 (1989). By focusing the agency's attention on the environmental consequences of its proposed action, NEPA "ensures that important effects will not be overlooked or underestimated only to be discovered after resources have been committed or the die otherwise cast." *Robertson*, 490 U.S. at 349. "NEPA procedures must ensure that environmental information is available to public officials and citizens before decisions are made and before actions are taken." 40 C.F.R. § 1500.1(b). The agency must consider all direct, indirect, and cumulative environmental impacts of the proposed action. 40 C.F.R. §§ 1502.16; 1508.8; 1508.25(c). NRC regulations at 10 C.F.R. §§ 51.10, 51.70, and 51.71 carry forward and supplement these requirements.

All these legal and policy reasons are all the more important where, as here, there is such as 'cozy' relationship between the NRC Staff and industry in general and Crow Butte, in particular, as a subsidiary of the largest uranium company in the World (which Cameco bills itself as). The EPA makes reference to the 'confused' nature of the NRC and/or Agreement State's setting of baselines and restoration standards in ways overly favorable to industry at the expense of and to the detriment to the environment, the public and the taxpayers. In the commentary to the Proposed Rules, the EPA states regulators and operators have used high-end values as baselines and that operators have been allowed to adopt alternates without showing efforts to achieve the regulatory standards:

> E. Why does EPA believe new standards are necessary?
>
> We believe that ISR-specific standards are necessary because uranium ISR operations are very different from conventional uranium mills and the existing standards do not adequately address their unique aspects.

In particular, we believe it is necessary to take a longer view of groundwater protection than has been typical of current ISR industry practices. Although the presence of significant uranium deposits typically diminishes groundwater quality, **current industry practices for restoration and monitoring of the affected aquifer may not be adequate to prevent either the further degradation of water quality or the more widespread contamination of groundwater that is suitable for human consumption.** (Emphasis added.)

Because monitoring after restoration is typically conducted for only a short period, we find it difficult to characterize the probability or magnitude of future contamination problems, or the costs involved in remediating such future contamination. **Such costs are not now borne by ISR licensees, nor is there any guarantee that they could be held responsible if contamination were detected by new monitoring implemented years, decades or even longer after the end of site activities once the facility is officially decommissioned and the license is terminated by the NRC or Agreement State.** It is likely, however, that the costs of such future remediation would far exceed the costs of the more extensive monitoring (in all phases of site activity) that we are proposing today, together with the costs of any additional restoration or prompt corrective action that may be required to address any issues identified as a result of the more extensive monitoring. In this sense, perhaps a generalized future cost of groundwater remediation can be viewed as a proxy for the value of groundwater and its protection. Similarly, because ISR activities often take place in areas that are sparsely populated, and any subsequent contamination may take years, decades or even longer to reach groundwater being consumed by humans, it is difficult to characterize the benefits of our proposal by applying typical Agency metrics, such as the number of cancers averted. (Emphasis added.)

We also recognize, however, that our efforts to protect groundwater must consider the use, value, and vulnerability of the resource, as well as social and economic values. We believe it is important to protect groundwater to ensure the preservation of the nation's currently used and potential underground sources of drinking water (USDWs) for present and future generations.

Also, we believe it is important to protect groundwater to ensure that where it interacts with surface water it does not interfere with the attainment of surface-water-quality standards; these standards are also necessary to protect human health and the integrity of ecosystems.

Thus, taking a more qualitative view of the situation leads us more broadly to consider the impacts on future groundwater uses. In many areas of the country, particularly in western states where ISR activities are most likely to take place, groundwater is a scarce and valuable resource that is being rapidly depleted to support increased demands. There is evidence that some communities are making efforts to utilize groundwater that is not of "good" quality, and in our view this trend will only increase.

Another critical issue in groundwater protection is that groundwater generally is not directly accessible. Thus, it is much more difficult to monitor and/or decontaminate groundwater than is the case with other environmental media. Because of the expenses and difficulties associated with remediation of contaminated groundwater, we believe it is prudent and cost-effective to prevent the occurrence of such contamination rather than rely on the cleanup of preventable pollution.

Thus, the Agency believes that it is in the national interest to preserve the quality of groundwater resources to the extent practicable, and that the best way to do so is to prevent contamination by addressing its source. (20) We believe today's proposal, which focuses on the source of potential contamination at ISR sites by stricter application of groundwater standards and more extensive monitoring to ensure that groundwater restoration will endure, is a reasonable and responsible approach to achieving this goal.

***

Most ISR sites historically have been unable to meet restoration goals for all constituents even after extensive effort. (22) Because the past practice of monitoring after restoration has typically been for a very limited time period, we do not know if the goals that are met for the short-term are maintained for a longer time.

***

In the absence of explicit regulatory language addressing ISR facilities, NRC and its Agreement States have used guidance and license conditions to implement many aspects of groundwater protection programs, including the selection of restoration goals and post-restoration monitoring. Based upon the information that we have reviewed, (23) we believe an even more rigorous approach is

warranted for (a) determining background groundwater concentrations, which are necessary to establish appropriate restoration goals, (b) establishing restoration goals, and (c) demonstrating the continued stability of groundwater after restoration. In addition, prolonged stability monitoring is needed to provide the necessary level of confidence that groundwater quality will not degrade over time or promote contaminant migration in the future.

***

IV. IV. What is the Rationale for today's proposal?

…

(2) How does today's proposal relate to existing 40 CFR part 192?

…

In 1983, EPA promulgated regulations at 40 CFR part 192 in response to the statutory requirements of UMTRCA….

Because the major environmental risk at that time was perceived to come from the conventional uranium mill tailings, which already existed in large volumes, other uranium recovery technologies, including ISR, received little attention.

As stated earlier, ISR has surpassed conventional milling as the dominant form of uranium extraction in the United States and is expected to predominate in the future.

…

With ISR, the "milling" of uranium ore is performed within the ore zone aquifer by injection of lixiviants. As stated earlier, the lixiviants can also liberate other elements, particularly metals that are often found co-located with uranium deposits. Their migration outside the production zone can potentially contaminate surrounding aquifers. Furthermore, when processing of the ore zone is no longer economically viable, ISR operators can release the site for future use, either by selling the land or returning the property to the original owner.

…

Whereas conventional mill tailings piles are under perpetual institutional control, current NRC regulations allow for ISR sites to terminate their licenses, essentially ending regulatory oversight of the site.

Today, EPA is reaffirming that ISR facilities are subject to the 40 CFR part 192 requirements. We seek to provide clear direction on how to monitor groundwater in and around the production zone during all phases of the ISR facility's lifecycle, and how to demonstrate geochemical stability at these sites.

…

We believe there has been some uncertainty about how to apply the current standards, which are more targeted to conventional mills, to ISR sites. In addition, there has been confusion about applicability of UMTRCA restoration requirements at aquifers that have been exempted from the standards of the SDWA. With the prospect of additional ISR facilities beginning operations, we believe it is necessary to clarify these issues. Therefore, we are proposing additional groundwater protection provisions to 40 CFR part 192 that are specific to uranium ISR facilities and consistent with the SDWA and RCRA. We believe these provisions are necessary to ensure that ISR sites are not released from regulatory control until it can be reasonably demonstrated that groundwater will not degrade over time.

…

Subsequent to the end of uranium production, the regulator must ensure that alternate standards are approved only after restoration has been attempted and it is clearly demonstrated that the initial groundwater protection standard(s) cannot be achieved, or once achieved, cannot be maintained. Such approval should take place only after the operator has made reasonable and satisfactory efforts to achieve and maintain the initial standard(s) and fully considered a number of factors. Whether the initial goals are met or alternate concentration limits are approved, conditions must be shown to be stable and groundwater quality must not degrade over time, as is possible when: lingering amounts of lixiviant solution remain in isolated pockets within the wellfield; reducing conditions are not fully reestablished; and/or the long-term stability monitoring period is too short compared to the time it takes for groundwater to move through the aquifer. Therefore, the operator must monitor groundwater at the site for a sufficiently long period after restoration is complete and use statistically significant results to

provide a reasonable demonstration that long-term stability has been achieved. This demonstration can include geochemical modeling to confirm the persistence of stability of the groundwater chemistry. Geochemical modeling can provide a defensible demonstration of an aquifer's natural capacity to maintain stability, which statistics alone cannot provide.

…

We intend for today's proposal to eliminate any confusion about the relationship of the aquifer exemption process to restoration requirements at ISR sites. We further recognize that the application of the existing standards in 40 CFR part 192 to ISR sites is not as straightforward as it could be.

Nevertheless, we believe there is sufficient information available to indicate that practices related to groundwater protection at ISR facilities have not been sufficiently rigorous to provide confidence either that groundwater is being restored appropriately or that such restoration will persist into the reasonably foreseeable future. (51 52 53)

…

2. ALTERNATE CONCENTRATION LIMITS (ACLS)

…

Today we propose to clarify the requirements for requesting and granting ACLs in the production zone, after restoration efforts have taken place. While the 19 criteria to be considered in granting ACLs are spelled out for Title II sites in 40 CFR 192.32(a)(2)(iv) through incorporation of 40 CFR 264.94(b), they have not always been implemented as intended. (59 60) In the past, NRC and Agreement States have issued secondary class-of-use restoration goals at ISR sites, but these goals were typically less restrictive than meeting background concentration levels. (61) NRC no longer recognizes class-of-use as an appropriate standard for restoration of groundwater at uranium ISRfacilities; (62) secondary class-of-use restoration goals are inconsistent with the requirements of 40 CFR part 192 and 10 CFR part 40, Appendix A. There is evidence that relaxed restoration standards have been granted in Agreement States, (63) and some instances where ACLs have been identified and approved by the regulator before restoration efforts have been initiated and/or completed. (64 65)

…

We believe these situations can result in insufficient protection of groundwater; in particular, we believe it only is appropriate to establish restoration goals based on a thorough characterization of the preoperational environment and not to approve ACLs unless it has proven impracticable to achieve or maintain the initial restoration goals or return to background conditions after restoration. With this proposal, we specify the conditions that must be met prior to requesting an ACL and emphasize the factors that must be considered in establishing and approving ACLs. These factors specify that, if ACLs are deemed necessary or appropriate after all best practicable restoration activities have been completed, they must not pose a substantial present or potential hazard to human health or the environment. (66)

…

C. Adequate Characterization of Groundwater Prior to Uranium Recovery

…

Today's proposal includes provisions to ensure that operators adequately characterize preoperational conditions inside and outside the wellfield. This characterization is necessary to establish appropriately protective restoration goals that are representative of the wellfield, accounting for natural variability. There is evidence that regulators and operators have at times used high-end values to represent the overall wellfield or have used a generalized "class-of-use" for the groundwater to set restoration goals. (72) We do not believe this is appropriate, as we explain below.

…

1. ESTABLISHING RESTORATION GOALS

…

We stated previously that we do not believe it is appropriate to select among high-end measurements as representative values for restoration. It might be argued, however, that restoring a given well to its preoperational values would be an indication that restoration would be equally successful in the rest of the wellfield. This might be the case at sites where remediation of groundwater is focused on removing a contaminant that has been introduced from outside the system; however, we question the general application of this assumption at ISR

sites. As discussed earlier, the initial deposition (precipitation) of uranium mineralization is uneven and alters the porosity and permeability of the host rock. The extraction and restoration processes at ISR sites are imperfect and further alter the distribution of the uranium in the deposit. Flow paths and velocities in local areas are altered as a result of changes in porosity and permeability that occur from the removal of material from pore spaces and later re-precipitation. It is possible that areas of heavy and lighter mineralization or groundwater concentrations can change from the distribution existing before uranium recovery to that after restoration, reflecting the degree to which the oxidizing and reducing agents contact the mineralization. As a result of these changes, "hot spots" may be found at wells that initially registered lower constituent concentration measurements, and vice versa.

Because of the site-specific nature of this variability, we are proposing today that operators utilize background measurements from across the wellfield, combined with appropriate statistical techniques, to determine restoration goals. As appropriate, goals may be developed for individual wells, groups of wells, or the entire wellfield. The point(s) of compliance for restoration will be determined by the operator and regulatory agency after a thorough technical evaluation of the operator's geophysical investigation.

***

Apparently, this has been going on a long time:

> Nowhere is there a greater need for close scrutiny by regulators and investigators than in the nuclear industry. Close scrutiny is needed because so much is at stake. Also, due to the inherent danger of nuclear power plants [and all radioactive materials], there is little margin for error. Nuclear power is not a forgiving technology….[R]egulation is not geared to those in any industry who would take precautionary measures even if it were not legally required. Regulation is addressed to those who would not take such steps on their own…..On the basis of the Subcommittee's investigation, we have reached several conclusions: First, the Nuclear Regulatory Commission has not maintained an arms length regulatory posture with the commercial nuclear power industry. Second, the NRC has, in some critical areas, abdicated its role as regulator altogether. Third, the NRC has tried to stifle its Office of Investigations (OI) from performing independent investigations of wrongdoing by licensees. See Exhibit D - "NRC Coziness With Industry - Nuclear Regulatory Commission Fails to Maintain Arms Length

Relationship with the Nuclear Industry," An Investigated Report by Subcommittee on General Oversight and Investigations, Committee on Interior and Insular Affairs, U.S. House of Rep., 100th Cong. 1st Sess. Dec. 1987.

There are many indications in the EPA commentary cited above that the NRC Staff failed to take a 'hard look' at restoration standards, and set high-end values and otherwise allowed easy and less rigorous and more confused than EPA have. Based on EPA's dis-satisfaction with how NRC and Agreement States regulate ISL operators, and in order to protect groundwater and surface water resources for future generations, EPA has issued the Proposed Rules.

Based on the foregoing, this contention should be admitted.

Contention F10: Failure to Take a Hard Look or Adequately Analyze or Describe Restoration Standards and Schedules, Including Delays, Resulting from Proposed Rules

The Final EA violates 10 C.F.R. §§ 51.10, 51.70, 51.71, the National Environmental Policy Act and implementing regulations, by failing to conduct the required "hard look" analysis at impacts of the Proposed Regulations associated with restoration standards and schedules, including delays, resulting from the Proposed Rules, and failure to describe such impacts in the Final EA. Accordingly, the Final EA is inaccurate and violates NEPA.

The Proposed Rules will affect changes to items related to Appendix A, Criterion 5, Criterion 7 and all schedules based on restoration and decommissioning set forth in the Final EA are now inaccurate and misleading and violate NEPA.

Final EA 2.1.2 provides:

***

2.1.2 Proposed Operating Schedule

Based on current plans, milling schedules, and reserve estimates, CBR could continue production at the present annual levels of approximately 800,000 pounds U_3O_8 until approximately the end of 2014, although the exact date is to be determined. At that time, the reserves would begin to deplete. Once depleted, ground water restoration, surface reclamation, and decommissioning would become the primary activities. Completion of ground water restoration in the currently licensed area is scheduled for 2023. Operations in the processing unit at the CBR facility would continue so that the expansion areas can process their uranium.

Projected production and restoration schedules for the current production area are shown as well as status of the current mine unit operations is shown in Table 1-1. The layout of the current and planned mine units in the licensed area is shown in Figure 3.

Table 2-1: Current Crow Butte Production Area Mine Unit Status

Mine Unit	Production Initiated	Current Status
Mine Unit 1	April1991	Ground water restored; Reclamation Underway
Mine Unit 2	March 1992	Ground water restoration
Mine Unit 3	January 1993	Ground water restoration
Mine Unit 4	March 1994	Ground water restoration
Mine Unit 5	January 1996	Ground water restoration
Mine Unit 6	March 1998	Production
Mine Unit 7	July 1999	Production
Mine Unit 8	July 2002	Production
Mine Unit 9	October 2003	Production
Mine Unit 10	August 2007	Production
Mine Unit 11	2013	Production

***

2.3 Restoration, Reclamation and Decommissioning 2.3.1 Aquifer Restoration

The current ground water restoration plan for the CBR facility mine units consists of four activities:

- Ground water transfer;
- Ground water sweep;
- Ground water treatment; and
- Well field circulation.

Consolidated Intervenors assert that under the Proposed Regulations there are more activities involved in restoration such as additional monitoring for stability as described in Subpart F. The Final EA continues:

***

4.6.2 Ground Water Impacts
4.6.2.1 Construction Impacts on Ground Water

During construction of ISR facilities, the potential for ground water impacts is primarily from introduction of drilling fluids and muds from well drilling, and spills of fuels and lubricants from construction equipment.

The Crow Butte facility currently has 11 mine units in various phases of operation (Figure 4-3). Mine Unit 1 has been restored and decommissioned; Mine Units 2 through 6 are undergoing ground water restoration; and Mine Units 7 through 11 are in the production phase (NRC, 2011).

In accordance with NDEQ Permit NEO122611, CBR cannot have more than five mine units in production and five mine units in restoration at any one time. Therefore, restoration will need to be completed on one more of the mine units before restoration begins on another. As CBR has no further wellfields planned for development, no construction is currently underway and none is planned. If any construction were to occur, it would be limited in scope (e.g. installing additional wells for improving restoration or capturing excursions).

***

4.6.2.2.4 Ground water Quality Impacts from Excursions

From 1995 to 2010, CBR placed 13 perimeter monitoring wells on excursion status, and 12 monitoring wells in the overlying aquifer had 16 excursion status events (Table 4-2). Corrective action for the perimeter ring wells primarily consisted of adjusting flows in the nearest production units to capture any outward flow. These corrective actions proved adequate in controlling the excursions in a timely manner for nine perimeter wells. For the other four wells (PR-8, PR-15, IJ-13, and CM5-11), the corrective action proved less effective. For three wells, (PR-8, PR-15, and IJ-13), CBR attributed the cause for the excursion status to the mine unit geometries (NRC 2014). For the fourth well (CM5-11), CBR attributed the inadequacy of the corrective action to differences in completion intervals of the perimeter well and the nearest production wells (NRC 2014). None of these excursions have impacted the surrounding ground water quality.

CBR attributed the excursion events for wells in the overlying (shallow) aquifer to natural fluctuations in water quality for the following reasons: (1) CBR has stated that the wells with excursions are located in Mine Units 6 and 8, which are in close proximity to the headwaters (including ground water seeps) for English Creek, (2) CBR has stated that ground water in the overlying aquifer is under the influence of surface water, and (3) CBR has presented data that correlate a rise in ground water levels with increased excursion parameter concentrations (NRC 2014).

For all excursion status events in the shallow aquifer, the events generally terminate within 90 days without corrective actions, which is consistent with the process for events not attributed to operations.

The NRC staff questioned whether the excursion events in MU6 and MU8 were a consequence of natural fluctuations in the water quality of the shallow aquifer in Section 5.7.9.4 of the SER (NRC 2014). The NRC staff agreed with the applicant that the excursion status to date for monitoring wells in the overlying (uppermost) aquifer did not appear to be a consequence of the migration of lixiviant from the production aquifer (NRC 2014). The excursions are coincidental with precipitation events, and no corrective actions by the licensee have been required to date. However, the NRC staff was concerned that spills or unintended releases of production fluids may be the source of the excursions. As a consequence of the continued number of excursions in the shallow overlying aquifer and the lack of evidence to support that all such excursions are a result of natural fluctuations, NRC has included a license condition which requires sampling for Natural Uranium and Ra 226 in addition to the indicator parameters when an overlying excursion monitoring well in Mine Unit 6 or 8 is placed on excursion status for more than 60 days (NRC 2014) to assess if there is any impact to ground water quality.

Based on the analysis of ground water quality impacts from excursions in the prior license period and the continued requirements for excursion monitoring to detect and take corrective action to eliminate the excursion, the NRC staff concludes that the long-term impacts on ground water from excursions will be SMALL.

Table 4-3: Summary of Excursions

Well	Mine Unit	Aquifer	Excursion Dates			Comments	Document Accession Number
			Initiation	Termination	Duration (days)		
Horizontal Excursion							
PR-8	1/2	P	12/23/2003	7/27/2010	2408	wellfield geometry	ML062860036; ML041140333; ML102250171
PR-15	1/2	P	9/28/2006	Present	850	wellfield geometry	ML062860036
U-13	1/3	P	12/27/2002	Present	2321	wellfield geometry	ML062860036
CM5-19	5	P	5/2/2005	7/26/2005	85		ML052280359
CM5-11	5	P	9/10/2002	7/3/2003	296	upper zone for production	ML031640167; ML022770128
CM6-7	6	P	4/4/2002	4/25/2002	21		ML021640176
CM6-6	6	P	7/2/1999	9/23/1999	83		ML003685594
CM8-12	8	P	7/8/2010	8/19/2010			ML102280222; ML102520624
CM8-21	8	P	1/8/2006	4/4/2006	86		ML061220279
CM9-3	9	P	5/30/2006	7/15/2006	46		ML062130060
CM9-4	9	P	6/11/2006	7/21/2006	40		ML092230727; ML092220670
CM9-5	9	P	5/15/2006	6/24/2006	40		ML062859966
CM9-16	9	P	8/4/2005	11/8/2005	96		ML053270239

***

4.6.2.3 Aquifer Restoration Impacts on Ground water

The potential environmental impacts to ground water quantity and quality during aquifer restoration are the same as those for operations, except ground water consumption is increased and there may be potential impacts from the introduction of brine slurries resulting from reverse osmosis in to waste storage ponds and deep disposal wells. In addition, aquifer restoration directly affects ground water quality in the vicinity of the well field being restored.

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The purpose of aquifer restoration is to return the ground water quality in the production zone to compliance with the ground water protection standards in 10 CFR Part 40, Appendix A, Criterion 5B(5). These standards require that the concentration of a hazardous constituent must not exceed (1) the Commission-approved background concentration of that constituent in ground water, (2) the

> respective value in the table in paragraph 5C if the constituent is listed in the table and if the background level of the constituent is below the value listed, or (3) an alternate concentration limit the Commission establishes. If ground water is restored to approved restoration standards, the impact on ground water quality in surrounding aquifers is negligible.

Consolidated Intervenors assert that all aspects of the Final EA concerning background concentrations, restoration standards, impacts on ground water quality and the like must be analyzed and re-done to describe the same in the context of the Proposed Regulations. The Final EA continues:

> ***
>
> CBR is concurrently restoring individual mine units while maintaining ISR operations within other mine units. The final approval of ground water restoration for Mine Unit 1 was granted by the NRC in 2003 (CBR, 2007). At that time, ground water restoration activities are occurring at Mine Units 2 through 6 (CBR, 2012). The restoration of these mine units(MUs) are projected to gain regulatory approval in 2015 for MUs 2 and 3, 2019 for MU 4, 2022 for MU 5, and 2021 for MU 6, respectively (CBR, 2012). However, restoration activities at Mine Units 2, 3, 4, 5, and 6 are still in progress. To accelerate ground water restoration, CBR has increased the flow capacity through the RO circuit from 200 to 1,150 gpm [757 to 4352 lpm], and the flow through the IX circuit has been increased from 200 to 1,200 gpm [757 to 4542 lpm] (CBR, 2012). In addition to the upgrades to the IX and RO circuits, CBR has installed new restoration pipelines and manifolds to allow for the increased flows and to improve wellfield isolations. In 2011, CBR began operating a second deep disposal well to help accommodate the disposal of additional waste water generated by the increased RO and IX flow.
>
> The NRC performed a water-balance analysis in Section 5.7.9.4 of the SER and based on the restoration analogues in the most recently approved license application and representations made by CBR, restoration of a mine unit will need at least extract eleven pore volumes of ground water for restoration (NRC 2014). Given the historical flow rates, it is anticipated that CBR may need to extract more than eleven restoration pore volumes for all mine units; thus, the restoration schedule may extend beyond that proposed by CBR. The extension of the restoration periods, as well as the greater than expected consumptive use rates, could significantly increase the drawdown in the potentiometric surface of the Basal Chadron aquifer, but it should still remain saturated. Consequently, the short-term impact from consumptive ground water use during aquifer restoration may be MODERATE. However, water levels would eventually recover after

aquifer restoration is complete resulting in an overall SMALL impact from consumptive ground water use.

4.6.2.4 Decommissioning Impacts on Ground water

Before decommissioning and reclamation activities can begin, CBR is required to submit a decommissioning plan to the NRC for review and approval. The environmental impacts on ground water during dismantling and decommissioning ISR facilities are primarily associated with potential spills of fuels and lubricants and well abandonment. Spills of fuels and lubricants during decommissioning activities could impact the water quality of shallow aquifers. CBR's implementation of BMPs, such as those identified in Section 4.2.2.3 of the ER, during decommissioning would reduce the likelihood and magnitude of such spills and facilitate cleanup (CBR, 2007A). Based on the applicant's proposed BMPs to minimize water use and spills, the estimated environmental impacts on the ground water resources in shallow aquifers from decommissioning would be SMALL.

After ISR operations are complete, improperly abandoned wells or exploratory borings could impact aquifers above the production aquifer by providing hydrologic connections between aquifers. As part of the restoration and reclamation activities, all monitoring, injection, production and exploration wells from previous activities will be plugged and abandoned in accordance with the Nebraska UIC program requirements. The wells will be filled with cement or clay or both and then cut off below plow depth to ensure that ground water does not flow through the abandoned wells. If this process is properly implemented and the abandoned wells are properly isolated from the flow domain, the estimated environmental impact would be SMALL.

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4.12 Public and Occupational Health Impact

4.12.1 Non-radiological Impacts

Impacts from decommissioning would be further minimized as CBR restores ground water to the appropriate restoration values set by NDEQ and Criterion 5B (5) of 10 CFR Part 40, Appendix A, thereby reducing the potential for non-radiological releases into ground water.

In conclusion, the NRC staff expects that non-radiological impacts to public and occupational health from the relicensing of the CBR facility would be SMALL.

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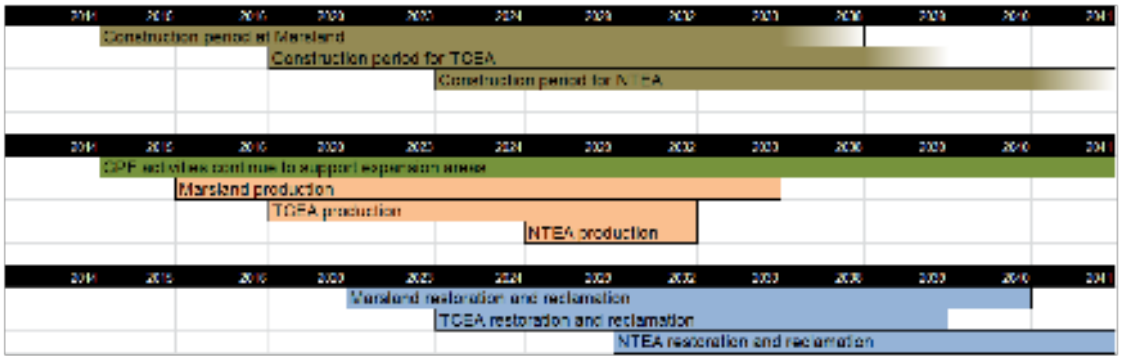
Figure 4-4 needs to be re-done -

Figure 4-4 Proposed Timeline of Construction, Production, Restoration and Reclamation at Proposed CBR ISR Expansion Areas



4.13.6.1.3 Cumulative Aquifer Restoration Impacts on Surface Water

The impacts from restoration activities will be similar to the impacts from operations, because the infrastructure will be in place and similar activities will be conducted (e.g., wellfield operation, transfer of fluids, water treatment, stormwater runoff). Restoration activities at the proposed expansion areas will also involve lined ponds and deep disposal wells. CBR will be required to implement the same monitoring requirements and engineering controls, and extraction activities will also be conducted under NDEQ permitting regulations to control runoff and sedimentation (such as the SWPPP). Restoration activities are anticipated to occur at the NTEA and TCEA during decommissioning of the CBR facility and therefore cumulative restoration impacts will be reduced.

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Based on compliance with applicable federal and state regulations and permit conditions and the implementation of administrative controls, best management practices, and other mitigation measures, the NRC staff concludes that cumulative impacts to surface water during aquifer restoration would not be significant.

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4.13.6.1.4 Cumulative Decommissioning Impacts on Surface Water

Surface water impacts from decommissioning will be similar to the impacts from construction. The NRC and NDEQ require CBR to decommission areas within the site boundary following the completion of active extraction and restoration. Part of this decommissioning involves the reclamation of a mine unit following successful completion of ground water restoration activities. Reclamation involves the proper plugging and abandonment of all wells within the mine unit boundary (specified in the Class III UIC permit); removal of surface and subsurface structures, utilities, and pipelines; and removal of surface and subsurface radiological contamination. CBR will submit a final detailed decommissioning plan for structures and equipment to the NRC for review and approval at least 12 months before the planned commencement of decommissioning of structures and equipment. This final decommissioning plan will describe structures and equipment to be decommissioned, planned decommissioning activities, methods that will be implemented to ensure protection of workers and the environment against radiation hazards, and the final radiation survey.

The CBR facility and proposed expansion areas would be subject to the same permits (NPDES, SWPPP) during decommissioning as during construction. Activities to clean up and to recontour and reclaim the land surface during decommissioning will mitigate impacts on surface waters by minimizing soil erosion and surface-water runoff.

Based on compliance with permit conditions and associated mitigation measures, the staff concludes that cumulative impacts to surface water during decommissioning would not be significant.

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4.13.6.2 Cumulative Impacts on Ground water

… at p116:

To minimize localized impacts during all phases of the uranium recovery lifecycle, NDEQ issued a Class III Underground Injection Control (UIC) permit for the CBR facility that stipulates that no more than 5 mine units are allowed at any one time in the extraction stage; no more than 5 mine units are allowed at any one time in the restoration stage; and no more than three mine units are allowed at any one time in the development stage in advance of active extraction. The NRC staff expects that permits for the proposed expansion areas will contain similar limitations.

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4.13.6.2.3 Cumulative Aquifer Restoration Impacts on Ground Water

Impacts on ground water quantity during aquifer restoration are related to ground water consumptive use. Water quality in shallow aquifers could potentially be affected by spills and leaks, and by waste management practices such as the use of waste storage ponds. Other potential impacts to ground water quality during restoration include possible horizontal and vertical lixiviant excursions beyond the production zone. Disposal of processing wastes and brine from reverse osmosis by deep well injection could also impact ground water in deep aquifers. Ultimately, ground water quality in the production zone will be improved, because the goal of aquifer restoration is to return the ground water quality to approved ground water protection standards, pursuant to 10 CFR Part 40, Appendix A, Criterion 5.B(5).

Restoration is ongoing in five wellfields at the CBR facility and will be required for the remaining wellfields. Restoration will also occur after operations cease at the proposed expansion areas. Potential cumulative impacts to ground water quantity during aquifer restoration activities will be primarily a function of whether the volume of water extracted from multiple wellfields results in a significant additive decrease in the potentiometric surface of the aquifers. As discussed in the previous section for operations, given the

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distance between the proposed expansion areas, the primary potential for overlapping zones of influence exists between the CBR facility and the NTEA.

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Potential impacts to ground water quality during restoration will be mitigated and reduced through implementation of leak detection and corrective action programs, mechanical integrity testing of wells, and adherence to NDEQ UIC permit requirements. Furthermore, CBR's excursion monitoring and corrective action program (described in Section 4.6.2.2.4) will continue to ensure the protection of water quality in the aquifers surrounding the production zone. EPA and NDEQ requirements will continue to protect ground water in aquifers used for the deep well injection of process-related liquid effluents from the CBR operating facility.

According to Figure 4-4, the restoration periods for the proposed expansion areas are staggered. Also, the NDEQ UIC permits for each facility will limit the number of wellfields in restoration at any one time. These factors would further limit potential cumulative impacts on ground water quality and quantity during restoration.

For the reasons discussed above, the staff concludes that cumulative impacts from aquifer restoration on ground water would not be significant.

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4.13.6.2.4 Cumulative Decommissioning Impacts on Ground Water

The environmental impacts on ground water during decommissioning at the CBR facility and the proposed expansion areas would be primarily associated with potential spills of fuels and lubricants and well abandonment. The potential environmental impacts during the decommissioning phase would be similar to the impacts from the construction phase. Spills of fuels and lubricants during decommissioning activities could, however, impact the water quality of shallow aquifers.

The same administrative and engineering controls used during construction would be implemented during decommissioning of the CBR facility and the proposed expansion

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areas. As discussed in Section 4.13.6.2.1, these controls include the required NDEQ Class III UIC permit which would minimize impacts to underground drinking water sources. During decommissioning, ground water quality of near surface aquifers would be protected by best management practices such as implementation of a spill prevention and cleanup plan to minimize soil contamination.

Based on the distances between the proposed expansion areas and the CBR facility, and protection of ground water quality through engineering and administrative controls (e.g., permits, BMPs), cumulative impacts from decommissioning on ground water quality would not be significant.

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Non-radiological impacts from decommissioning at the proposed CBR expansion areas would be further minimized as CBR restores ground water to the appropriate restoration values set by NDEQ and Criterion 5B(5) of 10 CFR Part 40, Appendix A, thereby reducing the potential for non-radiological releases into ground water. For these reasons, cumulative non-radiological impacts to public and occupational health from decommissioning are not expected to be significant.

Based on compliance with applicable federal and state regulations and permit conditions and the implementation of administrative controls, best management practices, and other mitigation measures, the NRC staff concludes that cumulative non-radiological impacts to public and operational health would not be significant.

Based on the foregoing, this contention should be admitted.

SER BASED CONTENTIONS

Contention F11: In Light of the Proposed Rules, the SER Fails to Adequately Evaluate Adverse Impacts on Public Health & Safety

The LRA and SER fail to meet the requirements of the AEA, NEPA, Part 40, Appendix A to Part 40, and Part 51 regulations because each lacks an adequate description.

Basis and Discussion:

10 C.F.R. §§ 51.10, 51.45, 40.9, 41.31, 51.70 and 51.71, the AEA, Part 40 and Appendix A thereto, and implementing regulations, require an accurate and complete description of the affected environment containing sufficient data to aid the Commission in its conduct of an independent analysis concerning public heath & safety and common defense & security.

In the following parts of the SER, the information would be made inaccurate by the Proposed Rules or by commentary by the EPA in promulgating the Proposed Rules, as follows:

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SER 2.4.3.2.2 Site Hydrogeology

> …The NDEQ reported that groundwater quality in these aquifers below the Pierre Shale is not suitable for local domestic water use due to high levels of total dissolved solids(NDEQ, 2010).

Basis for Contention:

The commentary at Section E to the Proposed Rules state that:

> We also recognize, however, that our efforts to protect groundwater must consider the use, value, and vulnerability of the resource, as well as social and economic values. We believe it is important to protect groundwater to ensure the preservation of the nation's currently used and potential underground sources of drinking water (USDWs) for present and future generations.

…

> In many areas of the country, particularly in western states where ISR activities are most likely to take place, groundwater is a scarce and valuable resource that is being rapidly depleted to support increased demands. There is evidence that some communities are making efforts to utilize groundwater that is not of "good" quality, and in our view this trend will only increase.

…

> Thus, the Agency believes that it is in the national interest to preserve the quality of groundwater resources to the extent practicable, and that the best way to do so is to prevent contamination by addressing its source. (20) We believe today's proposal, which focuses on the source of potential contamination at ISR sites by stricter application of groundwater standards and more extensive monitoring to ensure that groundwater restoration will endure, is a reasonable and responsible approach to achieving this goal.

…

> …NRC staff reported to the Commission that "the Nebraska and Wyoming groundwater protection programs were found to be not equivalent to the NRC's groundwater protection program."

Further, Section IV. of the EPA commentary to the Proposed Rules states:

> IV. What is the Rationale for today's proposal?

Groundwater is one of our nation's most precious resources. A significant portion of the U.S. population draws on groundwater for its potable water supply. In addition to serving as a source of drinking water, people use groundwater for irrigation, stock watering, food preparation, personal health and hygiene, and various industrial processes. When that water is radioactively contaminated, each of those uses becomes a radiation exposure pathway for people. Groundwater contamination is also of concern to us because of potential adverse impacts upon ecosystems, particularly sensitive or endangered ecosystems. For these reasons, it is a resource that needs protection.

…

We anticipate the objection that the presence of uranium deposits typically results in groundwater of poor quality, and not a pristine source of drinking water. We recognize that this is often the case, and that the volume of water affected by the mineralized zone may be significant. We do not, however, see this as a reason to allow this groundwater to be further degraded. The increasing scarcity of groundwater is leading some communities to consider using sources of water that previously would have been considered non-potable, using advanced treatment to make it suitable for livestock or human consumption. Since such advanced treatment may not be economically feasible for some communities, it is all the more important to prevent, as much as reasonably possible, additional degradation of the groundwater.

A guiding philosophy in radioactive waste management, as well as waste disposal in general, has been to avoid imposing burdens on future generations for clean-up efforts as a result of management approaches that are reasonably anticipated to result in pollution in the future. Adhering to the concept of sustainability, we should not knowingly impose undue burdens on future generations. Imposing performance requirements that avoid polluting resources that reasonably could be used in the future, therefore, is a more appropriate choice than imposing clean-up burdens on future generations. ISR facilities use significant volumes of water during both operations and restoration. We believe it is reasonable to make every effort to ensure that ISR activities leave groundwater in no worse condition than pre-ISR operational status.

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SER 2.6.1 evaluation determination would be different under Proposed Rules:

SER 2.6.1 Regulatory Requirements The staff determines if the applicant has sufficiently supplied data regarding background radiological characteristics for the license area so as to be in compliance with Criterion 7 of Appendix A to 10 CFR Part 40. 2.6.2 Regulatory Acceptance Criteria Changes to the current licensing basis were reviewed for compliance with the applicable requirements of 10 CFR Part 40, Appendix A, Criterion 7 using the acceptance criteria presented in Section 2.9.3 of NUREG-1569 (NRC, 2003).

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SER 2.6.3 does not reflect the operational monitoring required by the Proposed Rules:

2.6.3 Staff Review and Analysis …

The applicant is conducting an operational monitoring program consistent with 10 CFR Part 40, Appendix A, Criterion 7. The applicant provided operational environmental monitoring information and data in Section 5 of the Technical Report (CBR, 2009) and this information and data is reviewed by NRC staff in Section 5 of the SER. 2.6.4 Evaluation Findings As noted above, staff previously concluded that operation of the Crow Butte Project is protective of health and safety (NRC, 1989). Staff has found nothing to invalidate previous findings; therefore, the original findings stand and previous staff conclusions remain valid. In accordance with Appendix A of NUREG-1569 (NRC, 2003), staff has not identified any unreviewed safetyrelated concerns and therefore is not reexamining the results of the applicant's background radiological data.

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SER 3.1.3.1 is implicated by the Proposed Rules due to the extra pore volumes required for restoration, the costs of stability monitoring and long-term monitoring:

3.1.3.1 Mine Unit and Mineralized Zone Description NRC staff observes at the start of the previous renewal period (i.e., 1998), the applicant had production in three mine units (Mine Units 2, 3 and 4), development in one mine unit (Mine Unit 5) and restoration operations at one mine unit (Mine Unit 1). In Table 3.1-1 of the LRA, the applicant reported it has production operations in Mine Units 6 through 10 and restoration operations in Mine Units 2 through 5 (CBR , 2007a). Mine Unit 11 is currently under development for future production (CBR, 2007a). Mine Unit 1 has been restored and such was approved by NRC staff in 2003 (NRC, 2003c). In accordance with the requirements of the Nebraska Department of Environmental Quality (NDEQ) Class III Underground Injection Control (UIC) permit, the applicant can operate a maximum of

five mine units, restore a maximum of five mine units, and develop a maximum of three mine units, at any given time (NDEQ, 2009). Therefore, in order for the applicant to begin production operations in Mine Unit 11, the applicant must place one of currently producing mine units into restoration. NRC regulations do not require any such restrictions. NRC staff has previously approved the number of mine units in the prior license renewal (NRC, 1998) and has found nothing to invalidate previous findings; therefore, the original findings stand and previous staff conclusions remain valid. In accordance with Appendix A of NUREG-1569 (NRC, 2003a), staff is not reexamining this issue. NRC staff determined the areal extent of individual mine units varies from 3.7 to 44.8 hectares (9.2 to 110.72 acres) using data presented in the LRA in Section 6.1.4.2 (CBR, 2007a). The total area for all mine units within the license area is 189.4 hectares (468 acres). NRC observed notes the mineralized zone at all mine units is within the Basal Chadron Sandstone. Based on financial assurance calculations for the 2011 surety update (CBR, 2010c), the completion thickness for production wells in the mineralized zone at the CBR mine units varies from 3.8 to 5.9 m (12.5 to 19.6 feet), with the average completion thickness of 4.9 m (16 feet). The depth to the mineralized zone varies between 122 to 274m (400 and 900 feet). The depth to the mineralized zone increases in the southeastern direction. NRC does not regulate the areal extent of individual mine units; however, the size of this area has implications for other aspects under review by staff (e.g., pore volume estimates and schedules). NRC staff finds the physical description of the mine units and mineralized zone to be acceptable NRC staff observes the CBR facility uses a conventional seven-spot pattern as the typical mine unit production pattern. The LRA in Section 3.1.3 states that other patterns (e.g., 5-spot or alternating single line drives) may be used based on a specific mine unit configuration (CBR, 2007a). The applicant reported that the spacing between injection wells for a typical pattern is between 19.8 and 45.7m (65 and 150 feet) in LRA Section 3.1.3 (CBR, 2007a). Based on data supplied for the 2011 surety update (CBR, 2010c), the applicant reported 4857 wells within the license area (1690 production wells, 2789 injection wells, 201 monitoring wells in the overlying aquifer and 177 monitoring wells in the perimeter monitoring rings). The NRC staff notes the density of monitoring wells in the overlying aquifer is between one well per 0.77 hectares (1.9 acres) and one well per 1.82 hectares (4.5 acres) for all mine units. This density is consistent with the guidance of one well per 2 hectares (5 acres) in the current license (NRC, 2010b). The applicant does not have monitoring wells in the underlying aquifer because NRC staff previously determined the thickness and very low permeability of the underlying confining unit is sufficient to prevent any transport of fluids to an underlying aquifer. Each mine unit has between two and nine wellfield header houses. A wellfield header house controls the fluid flow to and from wells in the mine unit production patterns. The staff has previously approved the wellfield

> patterns and number and location of monitoring wells during the prior license renewal review (NRC, 1998). Staff has found nothing to invalidate previous findings; therefore, the original findings stand and previous staff conclusions remain valid. In accordance with Appendix A of NUREG-1569 (NRC, 2003a), staff is not reexamining this issue.

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SER 5.7.9 refers to the monitoring and standards in Appendix A, Criterion 5, and because those are impacted greatly by the Proposed Regulations, SER 5.7.9 is no longer accurate:

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> 5.7.9 Ground Water and Surface Water Monitoring Programs 5.7.9.1 Regulatory Requirements In this section, the staff determines if the applicant has demonstrated that the ground water and surface water monitoring program for the CBR facility meets the requirements of 10 CFR 40.32(c), 10 CFR 40.41(c), 10 CFR Part 40, Appendix A, Criterion 5B(5), and 10 CFR Part 40, Appendix A, Criterion 5D. 5.7.9.2 Regulatory Acceptance Criteria Unless specifically stated otherwise, changes to the current licensing basis were reviewed for compliance with the applicable requirements of 10 CFR Part 40 using the acceptance criteria for wellfield monitoring presented in Section 5.7.8.3 and for environmental monitoring in Section 5.7.7.3 of NUREG 1569 (NRC, 2003a). 5.7.9.3 Staff Review and Analysis Unless otherwise stated, information reviewed in this section is from information, data, and maps submitted by CBR in their application (CBR, 2007) and as updated.
>
> NRC staff visited the site on several occasions during the course of this review to confirm information presented in the application. In the LRA, the applicant described the ground water and surface water monitoring programs implemented at the CBR facility during operations. Preoperational monitoring, which was conducted as part of the site characterization or mine unit baseline data acquisition, is discussed in Chapter 2 of this SER. Restoration monitoring, which is conducted during ground water restoration of a mine unit, is discussed in Section 6.1 of this SER.
>
> The following sections address mine unit operational ground water monitoring, new mine unit hydrologic packages, and license area ground

> water and surface water environmental monitoring programs. 5.7.9.3.1 Mine Unit Operational Ground Water Monitoring The applicant indicated in Section 5.8.8.2 of the application that the operational monitoring program for all mine units consists of excursion monitoring at designated wells in the surrounding perimeter monitoring well ring and in the overlying aquifer (CBR, 2007).
>
> NRC staff observes the purpose for the perimeter monitoring well ring is to provide early detection of the movement of production fluids (horizontal excursion) from the mineralized zone (i.e., Basal Chadron Sandstone) in the wellfield. The purpose for the monitoring wells in the overlying aquifer is the early detection of movement of production fluids (vertical excursion) from the mineralized zone. The applicant has designated the upper part of the Brule Formation as the overlying aquifer. The applicant stated in Section 5.8.8.2 of the application that it has not installed monitoring wells in the underlying aquifer due to the presence of a thick and effective confining layer (Pierre Shale) below the ore-bearing aquifer (CBR, 2007). Staff has previously concluded that the number and location of the monitoring wells in the perimeter well ring and overlying aquifer were satisfactory during the prior license renewal review (NRC, 1998). NRC staff also found that excluding monitoring wells from underlying aquifer is acceptable for the monitoring programs (NRC, 1998).Staff has found nothing to invalidate previous findings; therefore, the original findings stand and previous staff conclusions remain valid.

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SER 5.7.9.3.2 indicates that MU-1 is not stable and would not comply with new Subpart F, Regulations 192.53:

> 5.7.9.3.2 Historical Excursion Monitoring Program and Data In license condition 11.2 (NRC, 2010b), the applicant is required to perform excursion monitoring which consists of biweekly monitoring of wells in the perimeter ring and overlying aquifer. The program consists of measuring three excursion indicators, alkalinity, conductivity and chloride, in each monitoring well and comparing the levels to Upper Control Limits (UCLs) established for the monitoring wells in each mine unit during the baseline (pre-mining) sampling.
>
> During the past license period, the parameters included in the excursion monitoring program were modified to the current three indicators by License Amendment 16 (NRC, 2003b). The indicators sodium and sulfate were removed from the list of parameters through review and

approval of NRC staff at that time. Under the applicant's current license (NRC, 2010b), if the indicators monitored during the excursion monitoring program exceed the UCL threshold, an excursion is suspected. The UCL threshold is the exceedance of UCLs for two excursion indicators or the UCL for any one indicator by more than 20 percent. Once the exceedance is confirmed, the well is placed on excursion status. The applicant must increase the monitoring from biweekly to weekly for all wells on excursion status. The excursion status is terminated if the levels of the excursion parameters for three consecutive weekly sampling events are below the UCLs. If the excursion is confirmed by a second or third set of samples, the applicant is required to notify NRC and begin corrective actions to eliminate the excursion. Corrective actions typically include pumping nearby wells to pull the excursion back into the wellfield, terminating injection near the well on excursion or a combination of both. The staff reviewed the excursion monitoring program of the Crow Butte facility in accordance with NUREG 1569 (NRC, 2003a) and through onsite inspections. For this review, NRC examined the inspection reports (NRC 1999,2001a, 2002, 2003c, 2004 – 2010a) and numerous excursion monitoring reports. The excursion monitoring program currently consists of biweekly sampling at 333 wells and weekly sampling at wells on excursion.

During that time, the applicant reported that 13 perimeter monitoring wells had been on excursion status at one time 125 or another and 12 monitoring wells in the overlying aquifer had 16 excursion events (SER Table 5.7-10). NRC staff observes the corrective actions for the perimeter ring wells on excursions consisted primarily of adjusting flow in nearest mine units to capture any outward flow. These corrective actions proved adequate in controlling the excursions in a timely manner for ten perimeter wells.

For three other wells (PR-8, PR-15, and IJ-13), the corrective action proved less effective. These wells are located in Mine Unit 1, which was the first mine unit in production. MU1 has undergone ground water restoration and the restoration was approved by the NRC. After restoration, these three wells were converted to perimeter monitoring wells for the subsequent mine units which completely encircle Mine Unit 1. In Table 7.4.1 in the license application (CBR, 2007), the applicant attributed the cause of the excursions to the bordering mine units whose combined operation causes fluids to be drawn into MU-1. NRC staff finds this explanation to be acceptable. NRC observes that at the completion of operations, the ground water in all mine units must be restored to the required standards, including any ground water contaminated at mine unit monitoring wells. **The NRC staff found the mine units experienced several vertical excursion events in the overlying aquifer. In Table 7.4.1 in the license**

application (CBR, 2007), the applicant attributed the vertical excursion events for wells SM6-12, SM6-18, SM6-20, SM6-23, SM6-28, SM8-6, and SM8-28, in the shallow overlying aquifer, to natural fluctuations in water quality. In an excursion report on well 6-28 (CBR, 2005), the applicant offered several lines of evidence to support that this well and the other wells in MUs 6-8 were subject to natural fluctuations in water quality. (Emphasis added.)

The applicant claimed: (1) the wells with excursions in the overlying aquifer are located in close proximity of the headwaters (including groundwater seeps) for English Creek; (2) the ground water in the overlying (shallow) aquifer is under the influence of surface water; and (3) the increased excursion indicator concentrations correlate with a rise in ground water levels and typically occur after rain fall events. **For all excursions in the shallow overlying aquifer, the applicant also noted the events generally terminate within 90 days without corrective actions by the applicant.** At the request of the applicant during the prior license period, NRC approved two license amendments to modify the excursion event reporting criteria to eliminate "false positives" for the shallow overlying aquifer based on applicant's contention that these excursion events were due to natural fluctuations in water quality. The first was License Amendment 8 (NRC, 2001b), which allowed the applicant to revise the methodology to calculate UCLs of indicators for parameters with concentrations below 50 mg/l. This modification was requested because the applicant reported the ambient chloride and sulfate concentration in the upper aquifer at Mine Unit 6 were quite low. The applicant stated this low threshold resulted in a calculated UCL that causes false positive exceedance for these indicators when the aquifer water quality varied under natural influence, such as seasonal fluctuations. NRC agreed and allowed the applicant to change the method of UCL to be calculated to account for greater variance (NRC, 2001b). The second was License Amendment 16 (NRC, 2003b) which allowed the applicant to remove sodium and sulfate from the list of UCL indicators. The applicant had requested this change to eliminate the reporting of false positive excursion events due to natural fluctuations in the aquifer. (Emphasis added.)

NRC staff observes that excursions continue to be routinely reported in the shallow aquifer, particularly in Mine Units 6 and 8. As of May 30, 2011, the applicant reported that monitoring wells SM6-20, SM6-28, SM8-6, and SM8-28 have returned to excursion status (CBR, 2011a, b, c, d). Given that NRC has twice amended the license to lower the number of excursion events triggered by natural water quality fluctuations, NRC staff finds the lines of evidence offered by applicant that the excursions may be attributed to natural fluctuations in water quality of the shallow aquifer may not be sufficient to account for these continued excursion

events. NRC staff finds no evidence for the influence of English Creek on the shallow excursion events. The applicant has provided no analysis that flow from English Creek enters the shallow aquifer in sufficient quantity or causes a change in water quality required to produce an excursion. NRC staff agrees that the increase in indicator concentrations appears to correlate with precipitation events; however, the precipitation events may create recharge which causes temporary pulses of ground water impacted by spills or leaks to migrate to the area. As an example, a large surface spill in 2000 in MU-6 from nearby injection well I-1274 was shown to directly impact shallow monitoring well SM6-12 (CBR, 2000) as a consequence of rapid migration to the shallow water table. NRC staff observes this spill was remediated in the groundwater, but some contamination may remain absorbed by soils in the vadose zone and be released to the water table during precipitation events or when the water table rises. The NRC staff agrees with the applicant that the vertical excursions to date for monitoring wells in the overlying shallow aquifer are not likely to be a consequence of the migration of lixiviant from the production aquifer. NRC staff also agrees that some of the excursions are coincidental with precipitation events.

However, NRC staff cannot exclude the possibility that spills or unintended releases of production fluids may move as pulses with precipitation events and may have affected the water quality of the shallow aquifer. Ground water impacted by these spills and releases may migrate along preferred paths (e.g., gravel beds to the trunk lines) and be the source of the excursions in the shallow aquifer. NRC staff observes that time series plots provided by the applicant of UCL indicators in the ground water at wells on excursion in the shallow aquifer often show a gradual increasing trend for an extended period of time which is indicative of a pulse (CBR, 2001, 2010). As a consequence of the continued number of excursions in the shallow overlying aquifer and the lack of evidence to support that all such excursions are a result of natural fluctuations,

NRC staff will therefore impose a new license condition for the monitoring wells placed on excursion in the shallow overlying aquifer in Mine Units 6 and 8. This license condition will require the applicant to test all shallow overlying aquifer wells in Mine Unit 6 and Mine Unit 8 that are placed on excursion status weekly for Natural Uranium and Ra 226 in addition to the required indicators of Alkalinity, Conductivity, and Chloride. The addition of these parameters will allow NRC staff to evaluate if these excursions are a consequence of natural fluctuations or are related to release or migration of ISR production fluids. This license condition is presented in SER Section 5.7.9.4. (Emphasis added.)

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SER (same section, at p.131):

> NRC staff finds that the applicant has not adequately demonstrated that the continued number of excursions in the shallow overlying aquifer are a result of natural fluctuations in water quality. NRC staff is therefore imposing the following license condition that will allow NRC staff to evaluate if these excursions are a consequence of natural fluctuations or are related to release or migration of ISR production fluids: If an overlying aquifer monitoring well in Mine Unit 6 or Mine Unit 8 is placed on excursion status per LC 11.5, the licensee shall test it weekly for natural uranium in addition to the required indicators of Alkalinity, Conductivity, and Chloride. The natural uranium data from wells on excursion status in the overlying aquifer in Mine Units 6 or 8 shall be maintained in the on-site records. If a well in these specific mine units remains on excursion for more than 60 days, the licensee shall provide the natural Uranium data with the UCL indicator data in the required sixty day excursion report in accordance with LC 11.5. Based on the detailed review of the groundwater and surface water monitoring at the Crow Butte ISR facility and the information in the license renewal application and the noted license condition,
>
> NRC staff concludes that groundwater and surface water monitoring programs are acceptable and are in compliance with 10 CFR 40.32(c), which requires the applicant's proposed equipment, facilities, and procedures to be adequate to protect health and minimize danger to life or property.

Consolidated Intervenors assert that the groundwater and surface water monitoring programs would not comply with the new Subpart F and so are not in compliance with 10 CFR 40.32(c).

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The SER further provides, in pertinent part, as follows:

> 6. GROUND WATER QUALITY RESTORATION, SURFACE RECLAMATION, AND FACILITY DECOMMISSIONING
>
> 6.1 Plans and Schedules for Ground Water Quality Restoration

> 6.1.1 Regulatory Requirements The staff determines if the applicant has demonstrated that the proposed plans and schedules for ground water quality restoration for the Crow Butte facility meet the requirements of 10 CFR 40.32(c), 10 CFR 40.42, and Criterion 5B(5) of Appendix A to 10 CFR Part 40. 6.1.2 Regulatory Acceptance Criteria Unless specifically stated otherwise, changes to the current licensing basis were reviewed for compliance with the applicable requirements of 10 CFR Part 40 using the acceptance criteria presented in Section 6.1.3 of NUREG-1569 (NRC, 2003a).

The Proposed Rules require new determinations by the Staff in order to make a determination that application has made the required demonstrations.

> 6.1.3 Staff Review and Analysis Unless otherwise stated, the information reviewed in this section is from information, data, and maps submitted by CBR in their application (CBR, 2007) and as updated. The staff also visited the site on several occasions during the course of this review to confirm information presented in the application. This section discusses plans for the ground water quality restoration activities at the Crow Butte facility. The plans include proposed restoration standards, baseline water quality evaluation, restoration methods, restoration stability monitoring, historical activities, and the proposed restoration schedule. 6.1.3.1 Restoration Standards NRC regulations require the ground water quality in the well field aquifer(s) after uranium extraction is terminated to be restored to the standards identified in 10 CFR Part 40, Appendix A, Criterion 5B(5). According to Criterion 5B(5), the concentration of each hazardous constituent may not exceed (a) the background concentration, (b) the maximum values for ground water protection in the Criterion 5C Table, if the constituent is listed in the table and if the background level is lower that the value in the table, or (c) an alternate concentration limit (ACL) proposed by a licensee and established by the NRC in accordance with Criterion 5B(6) of Appendix A to 10 CFR Part 40. NRC staff observes that the current license for CBR allows for a secondary restoration goal, referred to as "class of use "(NRC, 2010b) The use of this secondary restoration goal was contemplated by the guidance supplied in NUREG-1569 (NRC, 2003a). The NRC has since determined that the primary and secondary restoration goals

outlined in NUREG-1569 are inconsistent with the restoration standards in 10 CFR Part 40, Appendix A, Criterion 5B(5).

The NRC notified licensees and applicants in Regulatory Information Summary (RIS), RIS 09-05 (NRC, 2009b), that the restoration standards listed in NUREG-1569 (NRC, 2003a), Section 6.1.3(4), are not consistent with those listed in 10 CFR Part 40, Appendix A, Criterion 5B(5), and licensees and applicants must commit to achieve the restoration standards in Criterion 5B(5).

As stated above, the applicant may request to use ACLs as the ground water restoration standard. In order for a licensee to receive approval to use ACLs, the applicant must first demonstrate that for the constituents of concern in the well field being restored, it has made a reasonable effort to return those constituents to pre-operational baseline levels or to the respective Appendix A Table 5C value (if applicable), whichever level is higher. To establish ACLs, the licensee must request a license amendment which is subject to a safety and environmental review. A licensee can only propose ACLs that present no significant hazards for NRC's consideration. The NRC may establish a well field-specific ACL for a constituent only if it finds that the proposed limit is ALARA, after considering practicable corrective actions, and that the proposed limit would not pose a substantial present or potential hazard to human health or the environment as long as the ACL is not exceeded. The factors that the NRC must consider in reviewing an ACL license amendment request are set forth in 10 CFR Part 40, Appendix A, Criterion 5B(6). For ISR facilities located in Nebraska, the State's "class of use" standard is one factor, among several, that is considered in evaluating ACL requests, in accordance with Criterion 5B(6)(a)(v-vi) and (b)(vi-vii). The applicant reported in Section 6.1.3 of the LRA (CBR, 2007) that the primary restoration goal is to return the quality to the pre-operational baseline values on a parameter-by-parameter basis for each mine unit. The applicant then stated that if baseline cannot be achieved after diligent application of the best practicable technology, the applicant commits to returning the ground water to the secondary "class of use" values set by NDEQ in the UIC permit in Section 6.1.3 of the LRA (CBR, 2007). The applicant also stated that it recognized that NRC no longer accepted the "class of use" restoration standard, and committed in application Section 6.1.3 to meeting the regulations in Criterion 5B(5). The staff reviewed the applicant's discussion of restoration standards and finds this commitment to be consistent with the regulations. However,

> because the applicant has committed in the application to one restoration standard for the NDEQ UIC program and another restoration standard for NRC, there is insufficient clarity. Therefore, NRC staff will impose a license condition to ensure the implementation of Appendix A Criterion 5B(5) and 5B(6) regulations. This license condition is presented in SER Section 6.1.4 (1).

Consolidated Intervenors assert that the foregoing descriptions in the SER are now inaccurate because of the Proposed Rules and all the new EPA standards, including the licensee using 'extensive efforts' to meet the initial standards before asking for an alternate. As such the SER violates applicable regulations. The SER continues:

> 6.1.3.2 Baseline Water Quality The guidance in NUREG-1569 (NRC, 2003a) recommends the applicant evaluate the baseline water quality of the ore zone aquifer, overlying aquifer, underlying aquifer and perimeter monitoring well ring. NRC staff notes the ore zone aquifer baseline water quality is used to establish the background concentrations for hazardous constituents under Criterion 5B(5) for the ground water in the mine unit ore zone aquifer. Likewise, the overlying aquifer and perimeter monitoring well ring baseline water quality is used to establish the background concentrations for hazardous constituents that must be met under Appendix A Criterion 5B(5) for the ground water in these aquifers if restoration is required due to excursions or spills. The applicant stated in Section 6.1.3.1 that the baseline water quality of the ore zone aquifer in a new mine unit would be established by taking three samples every two weeks from each baseline well for all constituents of concern listed in application Table 6.1-1 (CBR, 2007).
>
> The 138 applicant stated it would sample at least one baseline well in every four acres of the mine unit. The applicant then stated that it will evaluate all the well data together for outliers. Once outliers are removed, the applicant will average the remaining data from all the wells together to determine the average baseline water quality for each constituent. NRC staff notes this method of baseline sampling and calculating the average baseline water quality was found acceptable for the current license(NRC, 2010b) ; however, NRC now concludes that this sampling approach does not provide a sufficient number

of samples or adequate analysis to ensure baseline water quality is established on a rigorous statistical basis (EPA, 2009a).

Specifically, NRC finds that the applicant must demonstrate whether it is appropriate to combine the data from the wells to determine the water quality on a wellfield interwell average (using all wells) as opposed to an intrawell average (well by well). To use an interwell average, as proposed, the applicant must first demonstrate there is no significant spatial variation across the ore zone aquifer in the mine unit (EPA, 2009a). If spatial variation exists, the mean and variance of a set of samples will vary with well location. If there is no spatial variation, the mean and variance will show no significant difference between wells. Therefore, the applicant can only average the data from many different wells (interwell) if it can be shown that the water quality values compared between individual wells have the same mean and variance. In Section 5.8.8.2 of the application (CBR, 2007) the applicant stated the baseline water quality for the overlying aquifer and the perimeter monitoring ring wells will be established.

The applicant stated the individual wells selected for the baseline water quality assessment will each be sampled three separate times. The samples at each well will be taken at least two weeks apart. The first, second and third samples will be tested for the excursion indicator parameters of chloride, conductivity and alkalinity. One set of samples will be tested for all constituents of concern. This proposed method for establishing the average baseline water quality for the overlying aquifer and perimeter ring monitoring wells was found acceptable for the current license (NRC, 2010b). However, NRC now concludes that this sampling approach does not provide baseline water quality for all constituents of concern as listed in application Table 6.1-1 as required in Criterion 5B(5). It also does not provide a sufficient number of samples or analysis to ensure baseline water quality is established on a rigorous statistical basis (EPA, 2009a) as explained above.

NRC staff therefore concludes the methods proposed in the LRA to establish mine unit baseline water quality are not satisfactory. NRC will therefore impose a license condition to ensure the baseline water quality is assessed in the ore zone aquifer, overlying aquifer and perimeter ring monitoring wells in a mine unit for all constituents of concern as required by Criterion 5B(5) and established in a statistically rigorous manner (EPA, 2009a). This license condition is presented in SER Section 6.1.4 (2).

Consolidated Intervenors assert that the foregoing described License Condition will be insufficient to comply with the Proposed Rules. SER further provides, in pertinent part, as follows:

> 6.1.3.3 Restoration Methods The applicant stated in Section 6.1.4.1 of the application that the restoration process consists of ground water transfer, ground water sweep, ground water treatment and ground water recirculation phases (CBR, 2007). The degree to which a phase is incorporated into the restoration process for a particular mine unit is determined by the applicant. 139 NRC staff notes the first phase, ground water transfer, consists of the exchange of ground water between a new mine unit and that of a mine unit at the end of production. For this to occur, a new mine unit must be ready at the time that restoration begins for an existing mine unit. The second phase, ground water sweep, consists of pumping ground water from the mine unit without any corresponding injection back into the mine unit under restoration. This purpose of this phase is to draw in impacted ground water from the perimeter of the wellfield. The applicant stated in Section 6.1.4.2 of the application (CBR, 2007) that the duration of the sweep phase depends upon the presence of mine units along the mine unit perimeter, capacity of the wastewater disposal system and success of the transfer phase to lower the total dissolved solids concentration. The third phase is the ground water treatment phase, which consists of pumping ground water from a mine unit, treating the ground water to remove the constituents mobilized during the production, and injecting some or all the treated water back to the mine unit. The treatment consists of ion exchange (IX), reverse osmosis (RO) or electro Dialysis Reversal (EDR). A reductant may be added during the treatment phase. The last phase the applicant may employ is groundwater recirculation, which is simply recirculating water pumped from the aquifer back into the aquifer to homogenize the ground water quality. The applicant's stated in Section 6.1.4.2 of the application (CBR, 2007)that the restoration of a typical mine unit consists of a variable number of pore volumes of ground water sweep, 6 pore volumes of ground water treatment and 2 pore volumes of ground water recirculation. A pore volume is defined by the applicant as the quantity of water contained in the pore spaces of the ore zone aquifer to be restored. The pore volume is calculated by multiplying the area of the ore zone aquifer by the aquifer thickness and the porosity.

The applicant stated that the 6 pore volumes for ground water treatment may consist of reverse osmosis and/or ion exchange treatment. The applicant indicated this restoration approach is based on experience during restoration of wellfields at the former R&D site and approved restoration at Mine Unit 1. The applicant stated in Section 6.1.4.2 of the application (CBR, 2007) that is has used and proposes to use chemical reductants during the groundwater treatment phase to improve the restoration performance. NRC staff notes chemical reductants change the oxidation/reduction potential of the ground water in the wellfield to induce precipitation of uranium and other constituents to lower their concentration in the groundwater. The applicant has also performed a pilot study using biorestoration to improve restoration performance. The applicant defines biorestoration as the injection of organic compounds in the groundwater in the wellfield to induce biological reduction to change the oxidation/reduction potential of the ground water in the wellfield to induce precipitation of uranium and other constituents. Specifically, the applicant has performed a limited trial of biorestoration on a 6-production-unit pattern at Wellhouse 9 in Mine Unit 4. The system was installed in December 2008 and the study is now complete (CBR, 2011a). Results of the biorestoration trial will be reviewed during a future NRC inspection. NRC staff finds the restoration methods used and proposed by the applicant are consistent with the previous license renewal applications and are based, in part, on restoration activities conducted for the approved restoration at the R&D wellfield and Mine Unit 1. NRC staff evaluated the restoration methods in the prior license renewal (NRC, 1998) and has found nothing to invalidate previous findings; therefore, the original findings stand and previous staff conclusions remain valid. In accordance with Appendix A of NUREG-1569 (NRC, 2003), staff is not reexamining this issue.

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At SER 139-140, the description is now inaccurate as a result of the Proposed Rules:

6.1.3.4 Restoration Stability Monitoring NRC staff noted that once restoration is completed for a mine unit, the applicant must conduct restoration stability monitoring to ensure that chemical species of concern (i.e., hazardous constituents) do not increase in

concentration above the Criterion 5B(5) restoration standards subsequent to restoration. The applicant has committed in Section 6.1.5 of the application (CBR, 2007) that once the restoration standards are met for a mine unit, a 6-month stability monitoring period will be initiated in which monthly samples will be collected from specified ore zone aquifer wells to demonstrate that restoration is stable and that there are no significant increasing trends in any of the constituents of concern. Based on the restoration plan, the applicant stated that it will determine the start of the stabilization period through the SERP process. The applicant indicated that it anticipates that the stabilization period for restored mine units may extend beyond the anticipated 6-month period based on its experience with prior restorations. NRC staff notes that the aforementioned stability monitoring practice proposed by the applicant was previously found to be acceptable by the staff and incorporated into the current license (NRC, 2010b). However, NRC staff finds to demonstrate statistical rigor, the stability monitoring must continue until at least the most recent four consecutive quarters of data indicate that constituent concentrations do not demonstrate any statistically significant increasing trend (EPA, 2009b). Therefore, NRC staff is imposing a license condition which will require quarterly monitoring of all constituents of concern at the specified ore zone aquifer wells until stability for all constituents of concern is established over at least four quarters. This license condition is presented in SER Section 6.1.4 (3). 6.1.3.5 Historical Restoration Results NRC staff has determined as of May 2011, the applicant has production operations in Mine Units 6 through 10. Mine Unit 1 has been restored to the required ground water quality standards; the restoration was approved by NRC in 2003 (NRC, 2003b). Mine Units 2-5 have been in restoration since 1996, 1999, 2003 and 2005, respectively. Mine Unit 11 is currently under development for future production. In accordance with the requirements of the NDEQ Class III UIC permit for CBR, the applicant can operate a maximum of five mine units, restore a maximum of five mine units, and develop a maximum of three mine units, at any given time (NDEQ, 2009). Therefore, in order to begin production operations in Mine Unit 11, the applicant must place Mine Unit 6 in restoration. In its May 2011 Monthly Restoration Report (CBR, 2011b), the applicant provided the most recent uranium and conductivity monitoring results from the wells in Mine Units 2-5 that track restoration progress. All of these mine units are currently undergoing RO treatment. In Mine Unit 2, the average uranium value is 1.32 mg/l vs. 0.046 mg/l for baseline. In Mine Unit 3, the average uranium is 2.3 mg/l vs. 0.115 mg/l for baseline. In Mine Unit 4, the

average uranium is 10.7 mg/l vs. 0.122 mg/l for baseline. In Mine Unit 5, the average uranium is 9.93 mg/l vs. 0.056 mg/l for baseline. The results indicate that none of these mine units have yet reached their baseline water quality for uranium.

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6.1.3.6 Restoration Schedule The applicant stated in Section 1.7 of the application that the production at the CBR facility is expected to be completed by 2014 and restoration completed by 2023 (CBR, 2007). While NRC has no regulations which specify the time in which restoration must be completed, the applicant was informed by NRC that is required to meet the requirements in 10 CFR 40.42(h)(1) which states the applicant must complete decommissioning within 24 months of initiating decommissioning or submit an alternate schedule for decommissioning for NRC review and approval in accordance with 10 CFR 40.42(i) (NRC, 2008). For an ISR, NRC defines that decommissioning begins when the applicant permanently ceases the injection of lixiviant in a wellfield (NRC, 2008). NRC notes that in the September 2009 inspection report, the applicant received a Security Level IV violation for its failure to request an alternate decommissioning schedule for Mine Units 2-5 (NRC, 2009a). The applicant was cited for failing to meet the requirements in 10 CFR 40.42 which required the applicant to complete decommissioning 24 months after the cessation of lixiviant into these mine units or submit an alternate schedule for decommissioning for NRC review and approval. On July 24, 2009, to address this violation, the applicant requested an alternate schedule for restoration of Mine Units 2 through 5 (CBR, 2009). The alternate schedule indicated that the restoration including regulatory approval should be completed by July 2012, July 2013, Jan. 2015 and July 2016 for Mine Unit 2, 3, 4 and 5, respectively. The alternate schedule was approved by NRC (NRC, 2010a) and the inspection issue was closed. In December 2010, the applicant provided NRC with notification of the cessation of lixiviant injection in Mine Unit 6. NRC considers this action to be the starting point of decommissioning for an ISR wellfield. The applicant also provided a restoration plan and alternate schedule for decommissioning for Mine Unit 6 (CBR, 2010). This request for an alternate schedule is currently under review by NRC staff. The alternate schedule indicated that the restoration for Mine Unit 6 should be completed by Dec. 31, 2019. Apart from staff's review of the abovereferenced request for an alternate schedule, NRC staff finds that the applicant's

schedule for restoration (CBR, 2007) is acceptable and meets the regulatory requirements.

6.1.4 Evaluation Findings Based on the information provided in the license renewal application as coupled with the corresponding detailed review by the NRC staff of the applicant's plans and schedules for ground water quality restoration at the Crow Butte ISR facility, the staff concludes that the applicant's plans and schedules for ground water quality restoration are in compliance with 10 CFR 40.32(c), requiring the applicant's proposed equipment, facilities, and procedures to be adequate to protect health and minimize danger to life or property. However, as previously discussed, to ensure the applicant: (1) meets the restoration standards for groundwater quality which are covered listed in Criterion 5B(5) of Appendix A in 10 CFR Part 40, (2) conducts an acceptable baseline water quality assessment, and (3) performs sufficient restoration stability monitoring, the NRC staff determined that the following license conditions are necessary:

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at 142-143:

1) Ground Water Restoration. The licensee shall conduct ground water restoration activities in accordance with the approved license application. Permanent cessation of lixiviant injection in a well field would signify the licensee's intent to shift from the principal activity of uranium production to the initiation of ground water restoration. Prior to initiation of ground water restoration activities, the licensee shall determine the restoration schedule. If the licensee determines that these activities are expected to exceed 24 months, then the licensee shall submit an alternate schedule request that meets the requirements of 10 CFR 40.42. Restoration Standards. Hazardous constituents in the ground water shall be restored to the numerical ground water protection standards as required by 10 CFR 40, Appendix A, Criterion 5(B)(5). In submitting any license amendment application requesting review of proposed alternate concentration limits (ACLs) pursuant to Criterion 5(B)(6), the licensee must also show that it has first made practicable efforts to restore the specified hazardous constituents to the background or maximum contaminant levels (whichever is greater). Restoration Stability Monitoring. The licensee shall conduct sampling of all constituents of concern on a quarter year basis during restoration stability monitoring. The sampling shall include the specified ore zone aquifer wells. The applicant shall continue the stability

monitoring until the data show the most recent four consecutive quarters indicate no statistically significant increasing trend for all constituents of concern which would lead to an exceedance above the respective Criterion 5B(5) standard. Changes to ground water restoration or post-restoration monitoring plans shall be submitted to the NRC for review and approval at least 60 days prior to ground water restoration in a well field. The restoration schedule for mine units two through five shall be as described in the request dated July 24, 2009, (ADAMS Accession No. ML092220668) and as approved in NRC staff's letter dated February 18, 2010(ADAMS Accession No. ML092510030). 2) Establishment of Background Water Quality. Prior to injection of lixiviant for each mine unit, the licensee shall establish background ground water quality data for the ore zone and overlying aquifers. The background water quality will be used to define the background ground water protection standards required to be met in 10 CFR 40, Appendix A, Criterion 5B(5), for the ore zone aquifer and surrounding aquifers. Water quality sampling shall provide representative background ground water quality data and restoration criteria as described in Sections 5.8.8 and 6.1.3 of the approved license application. The data shall consist, at a minimum, of the following sampling and analyses: A. Four samples shall be collected from production and injection wells at a minimum density of one production or injection well per four acres. These samples shall be collected at least 14 days apart. 143 B. Four samples shall be collected from each designated monitoring well at a minimum density of: 1) one upper aquifer monitoring well per five acres of mine unit area, and 2) all perimeter monitoring wells. These samples shall be collected at least 14 days apart. The results of these analyses shall constitute the baseline for each designated well. C. The samples shall be analyzed for ammonia, arsenic, barium, cadmium, calcium, chloride, copper, fluoride, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, nitrate, pH, potassium, radium-226, selenium, sodium, sulfate, total carbonate, total dissolved solids, uranium, vanadium, and zinc. D. Prior to operation of a mine unit, representative background concentrations shall be established on a parameter-by-parameter basis using either the mine unit or wellspecific mean value. E. The licensee shall submit all mine unit hydrologic test packages to the NRC for review.

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167-168: - Lic Cond 10.6 -

> 10.6 Ground Water Restoration. The licensee shall conduct ground water restoration activities in accordance with the approved license application. Permanent cessation of lixiviant injection in a well field would signify the licensee's intent to shift from the principal activity of uranium production to the initiation of ground water restoration. Prior to initiation of ground water restoration activities, the licensee shall determine 168 the restoration schedule. If the licensee determines that these activities are expected to exceed 24 months, then the licensee shall submit an alternate schedule request that meets the requirements of 10 CFR 40.42. Restoration Standards. Hazardous constituents in the ground water shall be restored to the numerical ground water protection standards as required by 10 CFR 40, Appendix A, Criterion 5(B)(5). In submitting any license amendment application requesting review of proposed alternate concentration limits (ACLs) pursuant to Criterion 5(B)(6), the licensee must also show that it has first made practicable efforts to restore the specified hazardous constituents to the background or maximum contaminant levels (whichever is greater). Restoration Stability Monitoring. The licensee shall conduct sampling of all constituents of concern on a quarter year basis during restoration stability monitoring. The sampling shall include the specified ore zone aquifer wells. The applicant shall continue the stability monitoring until the data show the most recent four consecutive quarters indicate no statistically significant increasing trend for all constituents of concern which would lead to an exceedance above the respective Criterion 5B(5) standard. Changes to ground water restoration or post-restoration monitoring plans shall be submitted to the NRC for review and approval at least 60 days prior to ground water restoration in a well field. The restoration schedule for mine units two through five shall be as described in the request dated July 24, 2009, (ADAMS Accession No. ML092220668) and as approved in NRC staff's letter dated February 18, 2010(ADAMS Accession No. ML092510030).

CONCLUSION

For all the foregoing reasons, the Board should find that the new contentions are admissible.

Dated this 16th day of March, 2015.

Respectfully submitted,

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/s/

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In the Matter of	)	
	)	
CROW BUTTE RESOURCES, INC. ,	)	Docket No. 40-8943
	)	ASLBP No. 08-867-02-OLA-BD01
(License Renewal for the	)	
In Situ Leach Facility, Crawford, Nebraska)	)	March 16, 2015

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing '**CONSOLIDATED INTERVENORS' MOTION FOR NEW CONTENTIONS BASED ON EPA PROPOSED RULES**, together with the Exhibits attached thereto and filed therewith, in the captioned proceeding were served via email on the 16th day of March 2015, which to the best of my knowledge resulted in transmittal of same to those on the EIE Service List for the captioned proceeding.

Respectfully submitted,

/s/

_____

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