UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY & LICENSING BOARD

In the Matter of	)	Docket No. 40-9091-MLA
	)	
STRATA ENERGY, INC.,	)	ASLBP No. 12-915-01-MLA
	)	
(Ross In Situ Recovery Uranium Project)	)	August 25, 2014

NATURAL RESOURCES DEFENSE COUNCIL'S & POWDER RIVER BASIN RESOURCE COUNCIL'S STATEMENT OF POSITION SUPPORTING ENVIRONMENTAL CONTENTIONS 1, 2 AND 3

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INTRODUCTION

In accordance with 10 C.F.R. § 2.1207 and this Board's Orders of July 25, 2014 and August 7, 2014, Intervenors Natural Resources Defense Council and Powder River Basin Resource Council (Joint Intervenors) hereby submit this Statement of Position on Environmental Contentions 1, 2 and 3 as previously admitted in this proceeding. This statement is supported by the Pre-filed Direct Testimony of Dr. Richard Abitz (Joint Intervenors' Exhibit 1 (hereinafter JTI001)), the Pre-filed Direct Testimony of Dr. Lance Larson (JTI003), and exhibits thereto (JTI005-050).[1]

Summary of Opening Statement

The National Environmental Policy Act ("NEPA"), 42 U.S.C. 4321, *et seq.*, requires the federal government write a straightforward, plain language accounting of the reasonably anticipated environmental impacts of its major federal actions. In this instance, before the licensing of an in-situ leach (ISL) uranium recovery operation in Crook Country, Wyoming, the NRC and the industry it regulates have had over four years to obtain, analyze, and then submit for public examination all of the environmental impacts of this proposed mine. Moreover, Joint Intervenors have three times submitted specific objections via the hearing process and further submitted extensive comments on the Draft of the Supplemental EIS ("DSEIS").

Rather than comply with NEPA and the relevant NRC rules, SEI and NRC Staff propose a host of assertions counter to NEPA's plain directions. SEI and NRC Staff suggest: (1) fundamental requirements of collecting and analyzing environmental data,

[1] Joint Intervenors will also be relying upon select exhibits supplied by NRC Staff and SEI in support of their contentions.

impacts and alternatives can be done long *after* licensing, the close of the NEPA process or any meaningful public review; (2) environmental impacts can be dismissed as "small" without any underlying analysis that demonstrates a corresponding minimal impact; and (3) concluding that environmental impacts are small when, in fact, existing data and analysis demonstrates that groundwater will be substantially degraded and there will be long-term harm to crucial natural resources. We address each of these propositions as we present our case on the three remaining admitted contentions.

With respect to Contention 1, the Final Supplemental EIS ("FSEIS") fails to adequately characterize baseline (i.e., original or pre-mining) groundwater quality, SEI and NRC concede the information is necessary to ensure public health and environmental protection. But, they promise the required data and information will be collected *at a future time* rather than as part of the licensing and NEPA review processes. Further, NRC and Strata also suggest the public should be content with the insufficient data disclosed thus far.

In contrast to this, Joint Intervenors will demonstrate that adequately characterizing baseline groundwater quality is *crucial* to a sound, meaningful NEPA analysis and, just as important, can be performed in a technically defensible manner that will allow the public and decision-makers to understand the environmental impacts and risks posed by the uranium mining operations *before* the agency decision is taken. Indeed, as the Board outlined in its August 12, 2014 ruling that this contention should be resolved at the hearing, Joint Intervenors have numerous specific concerns with the

approach taken in the FSEIS on this issue, *see* Aug. 12, 2014 Board Order at 19-21, each of which will be discussed below and are detailed in the accompanying direct testimony.

With respect to Contention 2, the failure to address the virtual certainty that SEI will be unable to restore groundwater to primary or secondary limits, and the need to disclose the reasonable range of hazardous constituents likely to remain on site in light of that certainty, SEI and NRC Staff assert it is premature to address these matters and purport to assure that, contrary to well-established historical precedent at other sites, SEI will be able to restore the aquifers and the resulting impacts to water quality will be "small." In response to Joint Intervenors' public comments on the DSEIS and the admitted Contention 2, the NRC staff added a selected smattering of restoration data from other ISL sites to the FSEIS, which Staff claims fulfills its obligation to disclose the likely outcome in the Lance District.

In contrast, Joint Intervenors will demonstrate the likelihood that the Lance District will remain highly contaminated at the conclusion of the restoration process, and why the information added to the FSEIS on other sites does not and cannot fulfill Staff's NEPA obligation to disclose the likely outcome – including, at minimum, a bounding analysis of likely results – at this site. Moreover, the data on other sites contained in the FSEIS is incomplete and misleading, as explained in Dr. Larson's direct testimony.

Finally, with respect to Contention 3, the FSEIS's failure to include adequate hydrological information to demonstrate SEI's ability to contain groundwater fluid migration, SEI and NRC Staff assert the environmental impacts of this migration would

be small even as they acknowledge that thousands of abandoned wells have yet to be located and plugged.

In contrast, Joint Intervenors will demonstrate the high likelihood of fluid migration because unplugged boreholes fundamentally compromise the assumption of confined (and therefore non-contamination transporting) aquifers. Joint Intervenors will also demonstrate that the FSEIS was technically inadequate to disclose the risks of fluid migration both because SEI's pump tests were inadequate to demonstrate aquifer confinement, and because the FSEIS does not require the use of excursion parameters likely to detect uranium excursions when they occur. Joint Intervenors will therefore demonstrate the risks to groundwater quality associated with the Ross project, and the failure of the FSEIS to adequately disclose these risks and likely outcomes.

I. APPLICABLE LEGAL AND REGULATORY REQUIREMENTS AND LEGAL ISSUES IN CONTROVERSY

A. The National Environmental Policy Act

The Ross Project EIS is subject to and governed by the National Environmental Policy Act ("NEPA"). 42 U.S.C. § 4321, et seq., the "basic national charter for protection of the environment." 40 C.F.R. § 1500.1[2]. NEPA's fundamental purpose is two-fold. First, it ensures the agency, in reaching its decision, will have available, and will carefully consider, detailed information concerning significant environmental impacts. Second, it guarantees the relevant information will be made available to the larger

[2] *See also Dept. of Transp. v. Pub Citizen*, 541 U.S. 752, 756 (2004) (explaining that NEPA establishes a "national policy [to] encourage productive and enjoyable harmony between man and his environment" and how NEPA was created to reduce or eliminate environmental damage and to promote "the understanding of the ecological systems and natural resources important to the United States.") (*quoting* 42 U.S.C. § 4321 (2011) (internal citations and quotations omitted)).

audience that may also play a role in both the decision-making process and the implementation of that decision. *Entergy Nuclear Generation Co. and Entergy Nuclear Operations, Inc.* (Pilgrim Nuclear Power Station), LBP-06-23, 64 NRC 257, 277 (2006) ("LBP-06-23") (quoting *Robertson v. Methow Valley Citizens Council,* 490 U.S. 332, 349 (1989)).[3]

NEPA ensures its mandate is met through the "action forcing" requirement for an Environmental Impact Statement ("EIS"), which provides a detailed assessment of the environmental impacts of the proposed action and weighs the costs and benefits of alternative actions. *Marsh v. Oregon Natural Resources Council,* 490 U.S. 360, 370-71 (1989); *Robertson,* 490 U.S. at 350-51. An EIS must be searching and rigorous, providing a "hard look" at the environmental consequences of the agency's proposed action. *Marsh,* 490 U.S. at 374.[4] NEPA requires that a proper environmental review must contain an evaluation of those aspects of a proposed action that will affect the quality of the human

[3] *See also Robertson v. Methow Valley Citizens Council,* 490 U.S. 332, 349 (1989) (Explaining that NEPA requires federal agencies to examine the environmental consequences of their actions before taking those actions, in order to ensure "that important effects will not be overlooked or underestimated only to be discovered after resources have been committed or the die otherwise cast."); *Baltimore Gas & Elec. Co. v. Natural Res. Def. Council, Inc.*, 462 U.S. 87, 97 (1983) (explaining that NEPA "ensures that the agency will inform the public that it has indeed considered environmental concerns in its decision making process."); *Morongo Band of Mission Indians v. Federal Aviation Administration*, 161 F.3d 569, 575 (9th Cir. 1998) ("NEPA was created to ensure that agencies will base decisions on detailed information regarding significant environmental impacts and that information will be available to a wide variety of concerned public and private actors.").

[4] *See also Robertson,* 490 U.S. at 350-51; *Midcoast Interstate Transmission, Inc. v. F.E.R.C.*, 198 F.3d 960, 968 (D.C. Cir. 2000); *Stewart Park & Reserve Coal., Inc. (SPARC) v. Slater,* 352 F.3d 545, 557 (2d Cir. 2003).

environment "in a significant manner or to a significant extent not already considered." *Marsh*, 490 U.S. at 374.[5]

B. Regulatory Requirements

The Council on Environmental Quality (CEQ) has issued regulations governing the preparation of an EIS which are binding on all agencies, 40 C.F.R. § 1500.3, including the NRC. *See, e.g., Brodsky v. NRC*, 704 F.3d 113, 120 n.3 (2d Cir. 2013) ("The weight of authority . . . holds CEQ regulations binding on federal agencies," including NRC) (citations omitted).[6] These regulations require an EIS to describe, *inter alia*, (a) "the environment of the area(s) to be affected" by the project, 40 C.F.R. § 1502.15, (b) "the environmental impacts of the alternatives including the proposed action," *id.* § 1502.16 – which includes the "effects on air and water and other natural systems, including ecosystems," *id.* § 1508.8(b) – and (c) "any adverse environmental effects which cannot be avoided should the proposal be implemented," *id.* at § 1502.16; *see also* 10 C.F.R. Pt. 51, Subpt. A, App. A, § 6. They also mandate where there is data "essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, *the agency shall include the information in the environmental impact statement*." 40 C.F.R. § 1502.22(a) (emphasis added).[7]

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[5] *See also Baltimore Gas & Elec. Co.*, 462 U.S. at 97 (explaining that NEPA "places upon an agency the obligation to consider every significant aspect of the environmental impact of a proposed action").

[6] *See also Piedmont Envtl. Council v. FERC*, 558 F.3d 304, 318-19 (4th Cir. 2009) (granting relief due to independent agency's failure to comply with CEQ regulations); *San Luis Obispo Mothers for Peace v. NRC*, 449 F.3d 1016, 1032-34 (9th Cir. 2006) (applying CEQ regulation to NRC).

[7] S*ee, e.g., Ocean Mammal Inst. v. Cohen*, No. 98-CV-160, 1998 WL 2017631, at *5 (D. Haw. Mar. 9, 1998) (finding "an agency is required to engage in reasonable research *to supply missing information*" in preparing an EIS to fulfill its "affirmative duty under NEPA and its implementing regulations to undertake

The Commission's own implementing regulations for the environmental review process impose similar requirements. Thus, the NRC's regulations require an EIS to "describe the environment to be affected by the proposed action," 10 C.F.R. Pt. 51, Subpt. A, App. A, § 6, and, more specifically, delineate certain data collection efforts required by a project proponent. As relevant here, those regulations require an applicant to provide "*complete baseline data* on a milling site and its environs" prior to construction and operation of the facility. *Id.* Pt. 40, App. A, Criterion 7 (emphasis added).

Moreover, Criterion 5 requires the establishment of background concentration limits for groundwater that may not be exceeded. *Id.*, Criterion 5B(5)(a) ("[a]t the point of compliance, the concentration of a hazardous constituent must not exceed . . . [t]he Commission approved *background concentration* of that constituent in the ground water") (emphasis added). As with NEPA, these regulations presume these steps will be taken in order to *inform* the agency's decision-making, rather than taken after the NRC has already made its decision by issuing a license.

C. Legal Issues In Controversy

The principal legal issues in controversy in this proceeding are the extent to which an applicant and agency must collect empirical data to include in an EIS in order to assess the existing environmental conditions and corresponding environmental impacts of a

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research in order to prepare a comprehensive EIS federal government officials can use to make a reasoned decision"); *Idaho Pub. Util. Comm'n v. ICC*, 35 F.3d 585, 596 (D.C. Cir. 1994); *Or. Envtl Council v. Kunzman*, 817 F.2d 484, 495 (9th Cir. 1987) (NEPA "imposes a duty on federal agencies to gather information and do independent research when missing information is important, significant, or essential to a reasoned choice among alternatives.") (citations omitted); *Greenpeace Found. v. Mineta*, 122 F. Supp. 2d 1123, 1135 n.16 (D. Haw. 2000) (same).

project, and the extent to which potential environmental impacts may reasonably be characterized as "small" where serious analytical and empirical gaps in the data exist.

Regarding Contention 1, Staff and SEI's principal *defense* for the failure to collect and establish baseline water quality levels as part of the NEPA and licensing process is that the applicant is *legally* prohibited from collecting such data pre-license. *See infra at* 42. This legal issue turns on the definition of the kind of "construction" that is in fact prohibited before a license is issued. Joint Intervenors contend that collecting baseline water quality information does not constitute such "construction," and rely principally on the applicable NRC regulation, which excludes as prohibited "construction" any "[s]ite exploration, including necessary borings to determine foundation conditions or *other preconstruction monitoring to establish background information related to the suitability of the site, the environmental impacts of construction or operation, or the protection of environmental values*." 10 C.F.R. § 40.4 (emphasis added). Joint Intervenors also rely on the 2011 regulatory preamble accompanying these regulations, which explain that this exclusion allowing certain pre-license activities covers any "*monitoring wells that are only intended to be used to collect background data or perform background aquifer testing*." 76 Fed. Reg. 56,951, 56,956 (Sept. 15, 2011) (emphasis added); *see also id* at 56,952 (explaining that the Commission has no regulatory authority over "site preparation activities, which are private actions" that are "not subject to its regulatory authority," and thus may occur prior to licensing).[8]

[8] SEI and Staff's arguments that there is a legal *bar* to collecting the baseline data Joint Intervenors seek until after the license is issued is also fatally undermined by the undisputed fact that SEI drilled more than 150 holes in the area from late 2012 to Spring 2013, all before the license issued. *See* Lance Project Update, May 24, 2013, at 2 (available at http://www.pel.net.au/images/peninsul---ahbue.pdf). The Board

Pursuant to the Board's August 12, 2014 Order denying summary disposition on Contention 1, even should Joint Intervenors prevail on this legal dispute, the Board will be called on to determine whether the water quality data and discussion included in the Final SEIS here meets NEPA's requirements. As explained above, *see supra* at 10-11, applicable regulatory requirements mandate much more data collection and analysis than what was included in the Final SEIS – matters explained in greater detail in the direct testimony of Dr. Abitz.

In addition, in 2003, the Commission issued an extensive Report further setting forth the requirements for consideration of license applications such as the one at issue here. SEI007, NUREG-1569 or "NUREG Report".[9] The NUREG Report explains that, in preparing an EIS on an ISL mining application, "[a]reas of potential environmental impact that are investigated include water availability and quality," and that to conduct such an investigation "it is necessary for NRC to establish background conditions for the affected area," which "may require collection of data over a larger geographic area than the licensed area, as well as collection of data in technical . . . areas that are beyond the

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certainly cannot accept SEI and Staff's legal argument that there is no legal basis for such drilling in the face of undisputed evidence that the *very same drilling was occurring on a massive scale before the license issued*. *Id.* (stating that "[d]uring the period October 2012 to April 2013 Strata completed 59 monitoring wells and 179 delineation holes for a total of 128,550 feet at the Lance Projects, the majority of the delineation holes being within and around the planned first production unit at Ross. The majority of the monitor wells are located in the Kendrick area. Twelve monitoring well clusters, comprising a total of 47 holes, have been completed in the Kendrick area and will be used for base line studies of the regional water quality. Additional monitor wells have also been completed at Ross to provide supplementary, site-specific geological and hydrological information within Mine Unit 1.").

[9] This Report is binding on NRC Staff. *Id.* at xv (emphasis added); *see, e.g., Chiron Corp. v. NTSB*, 198 F.3d 935, 943-44 (D.C. Cir. 1999) (guidance binding on an agency where agency intends to be bound). Note, SEI and Staff worked to timely provide Joint Intervenors their exhibit lists. However, due to last minutes efforts, NUREG-1569 was submitted as SEI007 and JTI007.

traditional scope of radiation safety assessments." *Id*. at 9. In particular, the Report explains, the "[c]haracterization of the hydrology at in situ leach uranium extraction facilities must be sufficient to establish *potential effects* of in situ leach operations on the adjacent surface-water and ground-water resources." *Id.* § 2.7.1 at 2-20 (emphasis added).[10]

As regards contention 2, the legal issue in controversy is whether purported water quality data from other ISL sites can legally substitute for disclosing the virtual certainty that SEI will be unable to restore groundwater at the Ross Project to primary or secondary limits, and can substitute for providing a site-specific bounding analysis of the

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[10] To evaluate these potential effects, the NUREG Report requires that the Commission, *inter alia*:

*include an "[a]ssessment of available ground-water resources and ground-water quality within the proposed permit boundaries and adjacent properties, including quantitative description of the chemical and radiological characteristics of the ground water and potential changes in water quality caused by operations," *id.* § 2.7.1(4), at 2-21;

*insure that "sufficient data have been collected and that the data support the applicant's hydrologic conceptual model for ground-water flow within and around the permit boundary," *id.* § 2.7.2(3), at 2-22;

* "[v]erify that a sufficient number of baseline ground-water samples are collected to provide meaningful statistics, that samples are spaced in time sufficiently to capture temporal variations, and that the chemical constituents and water quality parameters evaluated are sufficient to establish pre-operational water quality," *id.* § 2.7.2(4), at 2-22;

* collect "[r]easonably comprehensive chemical and radiochemical analyses of water samples, obtained within and at locations away from the mineralized zone(s) [in order] to determine pre-operational baseline conditions," *id.* § 2.7.3(4), at 2-24;

* determine "[b]aseline water quality . . . for the mineralized and surrounding aquifers," including "water quality parameters that are expected to increase in concentration as a result of *in situ* leach activities and are of concern to the water use of the aquifer," *id.;*

* collect "[a]t least four sets of samples, spaced sufficiently in time to indicate seasonal variability . . . and analyze[ ] for each listed constituent for determining baseline water quality conditions." *Id.*

likely outcomes at the site post-restoration. Even assuming the Board determines that data from other sites could in theory meet NEPA's requirements, as detailed in the direct testimony of Dr. Larson, the particular data included in the FSEIS falls far short of what would be necessary.

Finally, as regards contention 3, the legal issue in controversy is whether the FSEIS adequately supports its overall conclusions that the Ross Project will have only small impacts on water quality in the short and long-term. *See* SEI009A, FSEIS at xxii-xxiii; xxx; 4-34 to 4-50 (repeatedly characterizing impacts as "small"). It is well-established that an agency may not rely on "conclusory or unsupported suppositions," *McDonnell Douglas Corp. v. U.S. Dep't of the Air Force*, 375 F.3d 1182, 1186-87 (D.C. Cir. 2004), and it is insufficient to simply *assert* that an effect will be resolved at some point in the future. Moreover, courts have frequently rejected agency's use of conclusory labels like "small" and "moderate" to characterize impacts, where the agency does not explain the basis for these labels. *E.g. Greater Yellowstone Coal. v. Kempthorne*, 577 F. Supp. 2d 183, 201 (D.D.C. 2008); *Sierra Club. v. Mainella*, 459 F. Supp. 2d 76, 100-01 (D.D.C. 2006).

In this case, as detailed in the direct testimonies of Dr. Abitz and Dr. Larson, the FSEIS does not support its conclusions that the long-term impacts of the Ross Project on groundwater quality are likely to be small, in light of the serious risks of fluid migration posed by unplugged boreholes; the deficiencies associated with the fluid migration assessment; and the fundamental inadequacy of relying on a few cherry picked examples

(that when examined support Joint Intervenors' contention) as a basis for anticipating the likely outcomes here.

II. STANDARD OF REVIEW AND BURDEN OF PROOF

NRC Staff and SEI carry the burden of proof to demonstrate the environmental analysis took the required "hard look" at the environmental impacts associated with the issuance of a materials license for the Ross Project ISL uranium recovery site.[11] NRC has described the burden of proof in a NRC license proceeding as follows:

> [t]he ultimate burden of proof on the question of whether the permit or the license should be issued is . . . upon the applicant. But where . . . one of the other parties contends that, for a specific reason . . . the permit or license should be denied, that party has the burden of going forward with evidence to buttress that contention. Once he has introduced sufficient evidence to establish a prima facie case, the burden then shifts to the applicant who, as part of his overall burden of proof, must provide sufficient rebuttal to satisfy the Board that it should reject the contention as a basis for denial of the permit or license.

In re Amergen Energy Co., LLC (Oyster Creek Nuclear Generating Station), CLI-09-7, 69 N.R.C. 235, 269 (2009); *see also*, ASLB July 25, 2014 Order, ASLBP No. 12-915-01-MLA-BD01 at 2-3 (describing SEI "as the party with the ultimate burden of proof").

Thus, the applicant carries the ultimate burden of proof regarding the issuing of the renewed operating license. If a party challenges a licensing application, that challenging party must establish a prima facie case that the requirements have not been met. At that point, the burden of proof shifts back to the applicant to rebut the specific contentions. The applicant must demonstrate compliance with the applicable regulations by meeting a "reasonable assurance" standard, which is equated to a "preponderance of

[11] *See* 10 C.F.R. § 2.325 (2011) ("Unless the presiding officer otherwise orders, the applicant or the proponent of an order has the burden of proof.").

the evidence." *Amergen Energy Co. (Oyster Creek Nuclear Generating Station*), CLI-09-7, 69 N.R.C. 235, 263 (2009). To establish a prima facie case for a NEPA contention, it is only necessary to show that the NRC has failed to take a "hard look" at the issues raised.

Moreover, in defending the analysis in the FSEIS, Staff and Strata may *not* introduce new evidence that was not considered by Staff in connection with the preparation of the FSEIS. *See, e.g., Fla. Power & Light v. Lorion*, 470 U.S. 729, 744 (1985); *Ctr. for Biological Diversity v. BLM*, 698 F.3d 1101, 1124 (9th Cir. 2012) ("We cannot gloss over the absence of a cogent explanation *by the agency* by relying on the post hoc rationalizations" offered after the challenged decision was made) (emphasis added). To the contrary, any defense of the FSEIS must be confined only to materials before the agency at the time the FSEIS was issued. *See, e.g., Grand Canyon Air Tour Coal. v. FAA*, 154 F.3d 455, 469 (D.C. Cir. 1998); *Anacostia Watershed Soc. v. Babbitt*, 871 F. Supp. 475 (D.D.C. 1994) (rejecting agency's post-hoc arguments concerning NEPA compliance).

III. BACKGROUND

A. Contentions Against the ER

On October 27, 2011 and pursuant to 10 C.F.R. § 2.309 and the Nuclear Regulatory Commission's (NRC, or Commission) Federal Register notice published at 76 Fed. Reg. 41,308 (July 13, 2011), NRDC and PRBRC submitted a Petition to Intervene and Request for a Hearing in the above-captioned matter. NRDC and PRBRC presented several contentions addressing deficiencies in SEI's source materials license application and Environmental Report ("ER") for the proposed Ross ISR Uranium Project in Crook

County, Wyoming. Joint Intevenors submitted the following contentions: (1) [t]he application fails to adequately characterize baseline (i.e., original or pre-mining) groundwater quality; (2) [t]he application fails to analyze the environmental impacts that will occur if [SEI] cannot restore groundwater to primary or secondary limits; (3) [t]he application fails to include adequate hydrogeological information to demonstrate [SEI's] ability to contain fluid migration; (4) the application fails to adequately document negative impacts on groundwater quantity; and (5) [t]he application fails to adequately assess cumulative impacts of the proposed action in conjunction with other industrial activities in the area, and fails to evaluate adverse environmental effects resulting from an insufficient decommissioning bond and the disposal of 11e(2) byproduct material. The final contention also alleged that the ER did not properly consider impacts to visual resources at the nearby Devils Tower National Monument and improperly tiered to NRC's flawed Generic environmental impact statement ("GEIS") for ISL uranium mining.

On February 10, 2012, the Board held that Petitioners had established standing[12] and admitted two of their five contentions in whole while admitting the remaining three in part. *See* LBP-12-3, at 1–2, 18–25, 28, 32, 36, 37, and 39–40. On May 11, 2012 the Commission affirmed the Board's standing determination. *See* CLI-12-12.

[12] NRDC's and PRBRC's standing was confirmed in this Board's Order of February 2012 and the Commission's Order of May 2012. *See* LBP-12-3, "Memorandum and Order, Ruling on Standing and Contention Admissibility" at 1–2, 18–25; and CLI-12-12. As such, pursuant to 10 C.F.R. § 2.309(c)(4), NRDC and PRBRC are not required to address standing in this filing.

i. Contention 1- Baseline Water Quality (Admitted)

Contention 1, as originally formulated, claimed the ER lacked an adequate description of the present baseline (i.e. original or premining) groundwater quality, specifically relying on multiple authorities that mandate an adequate assessment of baseline water quality prior to licensing.[13] SEI and Staff objected to Contention 1, contending that the applicable regulations – in particular 10 C.F.R. § 40.32(e) – *prohibit* the collection of baseline water quality information before issuance of the license over which the NEPA review is being conducted.

On February 10, 2012, the Board admitted Contention 1 against the ER, explaining SEI and Staff are "*incorrect* in their . . . assertion that 10 C.F.R. § 40.32(e) prohibit[s] the applicant from gathering complete information on baseline water quality." LBP 12-3, 75 NRC 164, 193 (2012) (emphasis added) (citations omitted). To the contrary, because the applicable regulations *permit* the collection of such data, and the data is plainly critical to a meaningful analysis of the environmental impacts associated with the project, the Board concluded Joint Intervenors' contention 1 was admissible. *Id.* at 192-95.

ii. Contention 2 - Alternative Concentration Limits (Admitted)

Contention 2, as originally formulated, asserted that when the time comes for the Ross site to cease operations, SEI will be unable to restore the groundwater either to

[13] *See* 10 C.F.R. § 40.32(e), requiring a pre-license evaluation of "any appropriate conditions to protect environmental values," which, in the case of ISL uranium mining, necessarily entails an analysis of existing water quality. Similarly, 10 C.F.R. § 51.45(b) requires a "description of the environment affected;" and SEI and NRC Staff could not plausibly claim "the affected environment" does not encompass the groundwater in its current qualitative state. Criterion 5B(5)(a) of 10 C.F.R. Part 40, Appendix A specifies that "the concentration of a hazardous constituent must not exceed . . . [t]he Commission approved background concentration of that constituent in the ground water," a determination that necessitates an initial, adequate characterization of baseline water quality.

baseline quality (primary) or to drinking water quality (secondary) standards. This is so because no previous ISL mining operation has been able to restore groundwater to baseline standards and, therefore, it is a "virtual certainty" that SEI will be unable to do so, necessitating an alternate concentration limit (ACL). As a consequence, SEI would be required to request that the Commission set an ACL for contaminants (see 10 C.F.R. Part 40, App. A, Criterion 5B(5)(c)), and because restoring groundwater to a quality that is no lower than the ACL would necessarily result in a degradation of groundwater quality from pre-mining baseline conditions, we asserted that the SEI ER must outline the environmental impacts of such an ACL – *i.e.*, disclose what the resulting contamination is likely to be. *See* LBP-12-3 at 32.

SEI disputed our claim an ACL is inevitable, and both SEI and the Staff also attempted to characterize our argument as attacking the NRC regulations allowing an ACL.[14]

The Board admitted this contention with a lengthy discussion, first noting SEI "misses the point of Joint Petitioners' allegation," as Joint Intervenors made no assertion SEI would necessarily fail to comply with NRC regulations. *Id* at 32-33. The Board discussed that Joint Intervenors were not questioning whether an ACL was legally possible, but instead, the contention was focused on the factual implications of approving one. The Board then went on to state that under the agency's regulations implementing NEPA, the ER must discuss any "irreversible and irretrievable commitments of resources which would be involved in the proposed action." *Id*. at 33, citing 10 C.F.R. §

[14] *See* SEI Answer (Dec. 5, 2011) at 48-49; Staff Answer (Dec. 5, 2011) at 22-23; *see also*, *See* LBP-12-3 at 33.

51.45(b)(5). The Board observed that while an ISL mine must have an aquifer exemption, at the same time the ISL process will further degrade the baseline quality of the water, unless it can be restored. And unless the baseline can be restored, there will be an "irreversible and irretrievable" commitment of a resource the parameters of which must, under NEPA and agency regulations, be outlined in the applicant's ER. *Id*.

The Board further discussed two elements it deemed "potentially fatal" to Contention 2. *Id* at 34. The first addressed an assertion from Staff and SEI that given the differences that exist among well fields, it cannot be known exactly what alternative concentration will be deemed necessary to protect human health and the environment under the factors of Appendix A, Criterion 5B(6). The Board agreed with Joint Intervenors that what is called for is a "bounding analysis, something that is not unheard of in the context of NEPA analyses and does not seem untoward in this instance, given the importance of NEPA as a mechanism for providing information regarding the parameters of 'irreversible and irretrievable' resource commitments." *Id*. at 34-35.

The second "potentially fatal" challenge to Contention 2 was the assertion that SEI will be required to submit a license amendment request for an ACL and thus Joint Intervenors could petition for a new hearing regarding the sufficiency of the request at some later date many years hence. The Board rejected the assertion, noting "the ability of any interested person to obtain an AEA hearing at that point would not provide the relief Joint Petitioners should be able to obtain now, consistent with NEPA, i.e., a public explanation of the impacts of being unable to restore the mined aquifer to primary or secondary baseline and, instead, having to use an ACL, as that alternate limitation might

be implemented per a reasonable bounding analysis" before the project is approved in the first instance. *Id*.

iii. Contention 3 – Fluid Migration (Admitted in Part)

Contention 3 as originally formulated asserted the ER failed to include adequate hydrogeological information to demonstrate SEI's ability to contain fluid migration. As in Contention 1, SEI and the NRC Staff averred that a thorough review of the hydrogeology in the area is not necessary as part of the license application. SEI Answer at 50; Staff Answer at 24–25. SEIS further claimed Joint Intervenors did not submit sufficient evidence to demonstrate possible pathways for fluid migration. SEI Answer at 50–51. The Staff also asserted that, even if possible pathways exist, this fact is irrelevant because of "[t]he Applicant's commitment in the Application to seal all boreholes prior to operation." Staff Answer at 25.

Addressing the matters of the ER's analysis of geology/seismology relative to NRC requirements, the Board found Joint Intervenors had not provided adequate support for admission. *See* LBP-12-3 at 36. However, with respect to the groundwater hydrology related matters in the contention, the Board found the declarations of Drs. Moran, Sass, and Abitz contain detailed discussions regarding boreholes and aquifer isolation in the immediate vicinity of the Ross facility that raise questions about the groundwater hydrology associated with the site as detailed in the SEI application sufficient to establish material issues of dispute. *Id* at 37.

iv. Contention 4 – Cumulative Impacts (Admitted in Part)

Contention 4 as originally formulated asserted SEI's application violates 10 C.F.R. § 51.45 and NEPA by failing to properly analyze the project's impacts on groundwater quantity. Joint Intervenors further argued the application included conflicting information on groundwater consumption, which precluded an accurate evaluation of the project's impacts to area water quantity. SEI challenged the admissibility of Contention 4 in its entirety and again alleged that section 51.45 "does not prescribe any requirements for ERs to contain the level of detail on potential groundwater consumption described by the Council's experts." SEI Answer at 53. NRC Staff, by contrast, admitted that "while [it] does not entirely agree with Contention 4, it believes that the contention is admissible in part." Staff Answer at 27. Specifically, the Staff accepted that SEI "will likely develop more uranium recovery sites within the Lance District," and that "future ISR projects are *reasonably foreseeable*." *Id.* at 28 (emphasis added).

The Board admitted the portion of Joint Petitioners' environmental contention 4 regarding the cumulative impacts on groundwater quantity of the Ross project and the planned Lance District expansion. The Board also admitted concerns with the groundwater analysis, but declined to allow concerns about the computer modeling methodology utilized by SEI to calculate groundwater quantity impacts. *See* LBP-12-3 at 38.

v. Contention 5 – Challenge to GEIS, Lance District Expansion, Financial Assurance, and Visual Impacts (Admitted in Part)

Contention 5 as originally formulated asserted the application failed to adequately assess cumulative impacts of the proposed action in conjunction with other industrial activities in the area, failed to evaluate adverse environmental effects resulting from an insufficient decommissioning bond and the disposal of 11e(2) byproduct material, did not properly consider impacts to visual resources at the nearby Devils Tower National Monument and improperly tiered to NRC's flawed [generic environmental impact statement (GEIS)] for ISL uranium mining.

The Board separated Joint Intervenors' environmental contention 5 into its five component allegations: inadequate cumulative impacts analysis (5A); inadequate decommissioning bond (5B); disposal of section 11e(2) byproduct material (5C); visual impacts at Devils Tower National Monument (5D); and improper tiering to the NRC GEIS for ISL mining (5E). *Id*. at 39.

With respect to the cumulative impacts, Joint Intervenors claimed "the ER does not consider the impacts of past activities, including uranium exploration and ISL testing." Intervention Petition at 28. Second, they asserted "the ER does not consider the full cumulative scope of the Ross-Lance project contemplated by [SEI]," because the reasonably foreseeable impacts of the additional satellite facilities that SEI proposes to construct in the Lance District expansion are not adequately analyzed in conjunction with the Ross project. *Id*. at 28-29. Finally, Joint Intervenors asserted the combined SEI operations will have cumulative impacts on water quantity that are not discussed in the

ER and additionally alleged that water quality impacts will result from cumulative disposal of liquid waste via deep-well injection. *Id.* at 29.

SEI argued against the admissibility of each part and NRC Staff again acknowledged that "the element of contention 5 that disputes Strata's analysis of cumulative impacts involving future expansion of ISR projects in the Lance District and the use of the Ross CPP for those projects" is admissible. *See* Staff Answer at 31.

The Board denied admission to all parts of the contention except as it relates to cumulative impacts associated with the Lance District expansion, which the Board found to be sufficient to establish a material dispute adequate to warrant further inquiry. LBP-12-3 at 39-48.

B. Contentions Against the DSEIS

On March 21, 2013, Staff issued the Draft Supplemental Environmental Impact Statement for the Ross ISR Project (DSEIS), and on May 6, 2013, Joint Intervenors submitted a motion to migrate their admitted contentions to the DSEIS, and submitted one new contention. SEI and Staff devoted most of their opposition briefs to procedural hurdles they claimed (erroneously) Intervenors failed to surmount. They asserted, variously, Intervenors' arguments are too similar to those previously made, or are too dissimilar; are being presented too early, or too late; or can only be made against SEI but not NRC, or vice-versa – whatever argument that, as to a particular issue, would result in dismissal of the admitted Contentions.

i. DSEIS Contention 1 (Migrated)

For the second time – this time against the DSEIS – Joint Intervenors challenged the failure of the staff to adequately characterize baseline (i.e., original or pre-mining) groundwater quality. Again supported by an expert technical declaration, Joint Intervenors contended that in the DSEIS the staff failed to meaningfully correct SEI's original lack of baseline analysis and thus did not meet the 10 C.F.R. Part 40, App. A, Criterion 5B(5)(a) and Criterion 7 standards requiring disclosure and analysis of "background" groundwater constituents and "complete baseline data" for an ISL site as those are to be implemented pursuant to the staff's NUREG-1569 guidance to applicants to provide "[r]easonably comprehensive" water sampling data shown to be "collected by acceptable sampling procedures." Office of Nuclear Material Safety and Safeguards, NRC, Standard Review Plan for In Situ Leach Uranium Extraction License Applications, NUREG-1569, at 2-24 (June 2003). This analysis is required, Joint Intervenors explained, to furnish the baseline water quality data needed for an adequate staff NEPA analysis. Further, it was apparent from the DSEIS that SEI and the staff intended to *postpone* collecting the information that possibly could meet these Part 40, Appendix A standards (using methods that might, or might not, satisfy the staff's NUREG-1569 guidance) until *after* a license was issued to SEI. *See* Joint Intervenors' May 6, 2013 Motion at 7, 8-9.

Staff and SEI reargued the same positions as in the ER phase of the proceeding, suggesting applicable regulations – in particular 10 C.F.R. § 40.32(e) – prohibit the

collection of baseline water quality information before issuance of the license over which the NEPA review is being conducted, and thus nothing more is required under NEPA.[15]

As noted, the Board had originally admitted Contention 1 against the ER, explaining the applicant and Staff are "incorrect in their assertion that 10 C.F.R. § 40.32(e) prohibit[s] the applicant from gathering complete information on baseline water quality." LPB 12-3 at 28 (emphasis added). To the contrary, the Board concluded that because the applicable regulations *permit* the collection of such data, and the data is plainly critical to a meaningful analysis of the environmental impacts associated with the project, Joint Intervenors had framed an admissible contention. At the DSEIS stage, the Board admitted this same contention against the DSEIS, explaining that since Staff and SEI continued to assert that "the data required by Appendix A 'is not required to be provided at this time and does not yet exist,'" "the central deficiency alleged by Joint Intervenors' environmental contention 1 with regard to the SEI ER applies with equal force to the DSEIS." LPB 13-10 at 11-13.[16]

ii. DSEIS Contention 2 (Migrated)

For the second time – in this instance lodged against the DSEIS – Joint Intervenors asserted that the NRC failed to meaningfully analyze the environmental impacts that will occur when the quality of the groundwater at the site inevitably cannot

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[15] *Cf.*, SEI DSEIS Contentions Answer at 10 (rearguing ASLB cannot require an applicant to gather more baseline groundwater quality data than is permitted by 10 C.F.R. § 40.32(e)) with LBP-12-3 at 29–30 (rejecting SEI's arguments the water quality information desired by Intervenors would require drilling in violation of NRC's regulations)

[16] In its response to Joint Intervenors' motion, SEI indicated if the Board allowed this contention to advance for further litigation (which it did), SEI intended to file a dispositive motion. *See* SEI DSEIS Answer at 11, n.5. Joint Intervenors eventually filed for summary disposition on the matter, discussed *infra* at 40-42, but SEI never submitted such a motion.

be restored. Again with expert technical assistance, Joint Intervenors maintained the basic flaws in the ER remained in the DSEIS.

Once again, SEI propounded previously rejected objections to the admission of Contention 2. *Compare* SEI DSEIS Answer at 12–14 (rearguing its previous documents have provided reasonable assurances of an adequate groundwater restoration program and because of the regulatory structure, it cannot forecast ACL parameters) *with* LBP-12-3 at 33 (stating that SEI's characterization is "flawed," as an agency-approved ACL would not result in non-compliance with NRC regulations). Staff, however, asserted new text in the DSEIS addressed the purported lack of an analysis of the impacts of a failure by SEI to restore groundwater quality to primary or secondary limits. Staff DSEIS Answer at 17.[17]

Addressing SEI, the Board found just as with its initial ruling, the point of contention was not whether SEI could legally fail to restore groundwater quality to primary or secondary limits following the conclusion of operations at the Ross facility, but whether such a happenstance would be a nonspeculative "'irreversible and irretrievable commitment[] of resources'" such that the ER needed to provide an impacts

[17] NRC Staff, addressing the merits of Joint Intervenors' arguments, stated that if the aquifer cannot be returned to post-licensing, pre-operational conditions described in [supplemental EIS (SEIS)] Section 2.1.1.1, the NRC would require that the aquifer meet the U.S. Environmental Protection Agency (EPA) maximum contaminant levels (MCLs) provided in 10 CFR Part 40, Appendix A, Table 5C or Alternate Concentration Limits (ACLs), as approved by NRC (10 CFR Part 40; NRC, 2009b). For these reasons, the NRC determined in the GEIS that potential impacts to water quality of the uranium-bearing aquifer (i.e., ore zone, production zone or unit, or mineralized zone) as a result of ISR operations would be expected to be SMALL and temporary (NRC, 2009). NRC006A, DSEIS at 4-32. As Joint Intervenors explain below, this determination is in error.

analysis of such an occurrence. LBP-13-10 at 13; *cf.* LBP-12-3, 75 NRC at 196 (citations omitted).

Addressing the points made by Staff, the Board held the "DSEIS does not, as the ER did not, address the matter that is the crux of the concern engendered in admitted environmental contention 2, i.e., given that reasonably foreseeable environmental impacts are to be outlined in an agency's NEPA statement and that an ACL realistically may be necessary at the time of facility decommissioning, within a reasonable range, what is that ACL likely to look like and what are the associated environmental impacts associated with such an ACL." LBP-13-10 at 14. The Board then proceeded to outline the Contention with more "specificity."

iii. DSEIS Contention 3 (Migrated)

As with the first contentions, Joint Intervenors alleged the DSEIS failed to include adequate hydrological information to demonstrate SEI's ability to contain groundwater fluid migration. Supported by expert testimony, our claims regarding the deficiencies in the DSEIS discussion of boreholes and SEI pump tests were similar to those lodged against the ER.

SEI argued Contention 3 was not timely because the final Ross permit would reflect a commitment "to identify and properly plug and abandon historic wells in the area of influence prior to conducting appropriate aquifer testing to ensure no fluid migration." SEI Resp. at 15. Staff also asserted the Contention was resolved because the DSEIS does not conclude "there will be no fluid migration." Staff Resp. at 19.

The Board held the "DSEIS discussion of boreholes and SEI pump tests makes it apparent that the thrust of Joint Intervenors' claim regarding this alleged deficiency remains intact so as to maintain this aspect of this contention." LBP-13-10 at 17. And as it did with Contention 2, the Board proceeded to rewrite Contention 3.

iv. DSEIS Contention 4/5

As with the contentions against the ER, Joint Intervenors alleged the DSEIS failed to adequately assess the cumulative impacts of both the proposed action and the planned Lance District expansion project.

SEI objected to Contention 4/5, claiming an earlier Request for Additional Information addressed Joint Intervenors' concerns over cumulative impacts. *See* Strata Resp. at 19.[18] Staff claimed this Contention has been resolved because of the cumulative impacts analysis contained in the DSEIS. Staff Resp. at 22-23.

The Board found that the migration tenet was not applicable to this contention, given that, in the Board's view, the substantive basis of the cumulative impacts analysis asserted to be inadequate in the DSEIS differed significantly from that provided in the ER so that Joint Intervenors were required to file a new or amended contention to frame an admissible contention. LBP-13-10 at 20. As a consequence, the Board required a showing regarding the section 2.309(f)(1) admissibility factors (as well as the section 2.309(c) "good cause" factors). Because Joint Intervenors had not invoked these standards (not

[18] In response, Joint Intervenors noted by its very terms the RAI did not address the cumulative impacts of the project; rather it asked SEI to identify activities that might give rise to impacts that *Staff* would then analyze in the SEIS. *Id.* at 19 (asking Strata to provide information about planned activities that is needed "to assess cumulative impacts on environmental resources . . . ."). Accordingly, the RAI does not in fact endeavor to discuss in detail or otherwise analyze the cumulative impacts associated with these activities, but simply outlines further activities that may occur in this area. *Id.* at 22. Further, this argument is impossible to reconcile with Staff's argument that cumulative impacts analysis is only required in NEPA documents. NRC Staff Resp. to Pet. Mot. To Int. at 29, (Dec. 5, 2011)

thinking them applicable), the motion to apply Contention 4/5 to the DSEIS was deemed insufficient. Thus, the Board kept the contention as originally admitted, with its focus on the adequacy of the SEI ER, further noting "to what degree this contention's pre-DSEIS concern regarding the ER can now be amended to center on the DSEIS, or, in the absence of such an amendment, remains relevant or material to the environmental portion of this proceeding so as to be a litigable post-DSEIS issue statement are matters that the parties may wish to address in the context of additional motions submitted in accord with the proceeding's existing general schedule or as otherwise might be appropriate in light of this ruling." LBP-13-10 at 22.[19]

On August 5, 2013, Joint Intervenors filed a motion for reconsideration concerning the cumulative impacts contention, urging the Board either accept the contention as migrated to the DSEIS, or alternatively consider it to be an amended contention. On August 27, 2013 the Board denied the motion, on the grounds that Intervenors had failed to explicate precisely how the contention satisfied each of the 10 C.F.R. § 2.309(c) "good cause" factors, and failed as well to explicate how each of the separate 10 C.F.R. § 2.309(f)(1) admissibility factors was satisfied. Aug. 27, 2013 Order at 4-6. As regards Intervenors' arguments that it was apparent that the contention satisfied all of these factors, the Board explained that in light of Intervenors' "legal and technical resources," it was incumbent upon them to fully explicate how each factor is

[19] We note that at least one other Board has expressed the view that a contention migrates unless the opposing party seeks its dismissal. *See* the ruling in the Powertech USA, Inc. proceeding, where the Board held the proper procedural vehicle to assert that a migrated contention has been resolved is a summary disposition motion, not a response to a motion to migrate or amend contentions. *In the Matter of Powertech USA, Inc*. (Powertech USA, Inc.), LBP-14-15 (Apr. 28, 2014) at 10 and n.45.

satisfied, and, having failed to do so, the Board would not allow the contention to be admitted. *Id.*

v. DSEIS Contention 6

Joint Intervenors also sought to present a new contention against the DSEIS, alleging NRC had failed to properly define the scope of the proposed major federal action here, which encompasses a much larger project in the same geographic area, as revealed in the DSEIS and in documents drafted by SEI's Australian parent company, Peninsula Energy, Ltd.

Joint Intervenors explained that the description of the overall project set forth in the DSEIS, combined with then recent announcements by SEI and its corporate parent, revealed the proposed project covered by the DSEIS is, in fact, a sub-part *of a much larger project* that will take place in the same geographic area. May 6, 2013 Motion at 19-23. SEI and Staff claimed this Contention was untimely (Strata DSEIS Answer at 21; Staff DSEIS Answer at 25-26) and conflicted with established law, and contended that the DSEIS's scope was inflexible because SEI's license application must define the parameters of Staff's NEPA review (*Id*. at 22; *Id*. at 26, respectively).

While not agreeing with SEI and NRC that the scope of the EIS was limited to the scope of the application, the Board denied admission of Intervenors' new contention, concluding Intervenors had not presented sufficient evidence showing a genuine dispute exists regarding whether the Ross Project will have independent utility, and that Intervenors' argument concerning the other elements necessary to prevail on this contention were not timely. *Id.* at 22-32. Indeed, while the Board acknowledged in its

extended discussion "these assertions all support the premise that there is a strong likelihood that PET/SEI intend that eventually all the Lance District ISR sites will be licensed and operating," the Board concluded "they are not the same as showing, as would be pertinent to the question of whether the Ross ISR facility is a 'connected' action as defined in section 1508.25(a)(2), that the Ross facility lacks any independent utility in the absence of the completion of the other Lance District ISR sites." *Id*. at 29-30. The Board also took issue with Joint Intervenors' timing, stating that by the time of the filing of their October 2011 hearing petition or perhaps shortly thereafter, Joint Intervenors could have sought to raise the question of whether, in accord with section 1508.25(a)(2)–(3), the Ross ISR site and the other Lance District ISR sites did constitute "cumulative" or "similar" actions such that a single SEIS addressing all potential Lance District ISR sites was appropriate. *Id*. at 31.[20]

C. Contentions Against the FSEIS

On February 28, 2014, the Board made the FSEIS publicly available. On March 31, 2014, Joint Intervenors timely filed a motion seeking to (1) migrate or amend the four already-admitted contentions so as to carry them forward in light of the staff's FSEIS to the ISR generic EIS; and (2) admit two new contentions based on the staff's FSEIS to the generic EIS.

i. FSEIS Contention 1 (Admitted)

For the third time – this time directed at the FSEIS – Joint Intervenors submitted their challenge to the failure to adequately characterize baseline (*i.e*., original or pre-

[20] Joint Intervenors respectfully disagree with the Board's ruling on these and other points, and intend to pursue those issues on appeal at the appropriate juncture.

mining) groundwater quality and disclose the results of such environmental data in the staff's NEPA document. The gravamen of contention 1 remained unchanged and concerned the failure to collect adequate groundwater quality information to *inform* the NEPA process.

Both Staff and SEI again sought to relitigate the Board's ruling that the applicable regulations do not prevent collection of baseline water quality data, and thus the conclusion that Intervenors have presented an admissible contention regarding whether Staff has collected and presented the necessary baseline water quality information. In particular, Staff and SEI once again argued there is no obligation to collect this data before the license was issued, and SEI is precluded from collecting it. Staff FSEIS Answer at 13; SEI FSEIS Answer at 7-13 (arguing that the contention was admitted based on a "mistaken legal conclusion"). Further, NRC Staff continued to make its irrelevant assurance that further data will be collected before operations begin (Staff FSEIS Answer at 11-12*)* but after the NEPA and licensing process are complete.[21]

The Board had already rejected this precise argument twice before and did so again for the third time. Specifically, the Board held it had "no difficulty in concluding

[21] Notably, this third attempt to re-litigate the purported ability to collect baseline data after the licensing and NEPA process was lodged subsequent to Joint Intervenors' presentation of SEI's significant drilling program at the site. *See* Second Paine Declaration at ¶ 26, citing a Peninsula Energy (SEI's parent company) document that stated, "During the period October 2012 to April 2013 Strata completed 59 monitoring wells and 179 delineation holes for a total of 128,550 feet at the Lance Projects, the majority of the delineation holes being within and around the planned first production unit at Ross. The majority of the monitor wells are located in the Kendrick area. Twelve monitoring well clusters, comprising a total of 47 holes, have been completed in the Kendrick area and will be used for base line studies of the regional water quality. Additional monitor wells have also been completed at Ross to provide supplementary, site-specific geological and hydrological information within Mine Unit 1." Lance Project Update, May 24, 2013, at 2, found online at http://www.pel.net.au/images/peninsul---ahbue.pdf.

this contention regarding pre-mining groundwater quality should migrate as an FSEIS-related contention and thus do not need to consider the need for a contention amendment to accomplish this transition." ASLB May 23, 2014 Order at 7.

ii. FSEIS Contention 2 (Admitted)

Again, for the third time and this time lodged against the FSEIS, Joint Intervenors asserted the NRC failed to analyze the environmental impacts that will occur if the applicant cannot restore groundwater to primary or secondary limits. Joint Intervenors' motion was supported by the original declarations of Drs. Moran and Abitz and a new declaration from Drs. Abitz and Larson.

For the third time SEI proffered various legal arguments as to why this contention should not have been admitted initially. The NRC Staff, by contrast, asserted that neither the migration nor the amendment outcome is appropriate because the staff included in the FSEIS (at 4-46) a discussion of three sites that received restoration approval. According to NRC, these historical concentration value ranges provide "an idea of what a range of possible ACLs for the Ross Project might look like, and accordingly are representative of the impacts that might result should Strata be unable to restore the Ross wellfields to post-licensing, pre-operational values." Staff FSEIS Answer at 17 (footnote omitted). Ultimately, the FSEIS concluded that the post-restoration impacts would be small. *See* FSEIS at 4-44 to 4-48, sections 4.5.1.3. and 4.5.1.4, *Ross Project Aquifer Restoration and Decommissioning* **.**

The Board ruled first that "SEI's arguments are best consigned to a dispositive motion."[22] Next, while the Board found NRC Staff's historical discussion to be the type of additional new analysis that requires an attempt at amending the contention on the Joint Intervenors part, the Board found Drs. Abitz and Larson proffered a number of concerns regarding the additional information provided in the staff's FSEIS, including:

> "(1) the lack of any quantitative analysis of the impacts of (a) the increased radium-226 and uranium concentrations at the Crow Butte facility, and (b) the increased uranium and heavy metal concentrations at the Smith Ranch-Highland facility; and (2) relative to the nine wellfields involved at the Irigaray facility, the use of a composite average "baseline" and restoration uranium concentration to derive a post-restoration uranium concentration that is substantially lower than the individual wellfield average post-restoration uranium concentrations as calculated using the initial average "baseline" concentrations for each individual wellfield, a data set that more accurately reflects the reality of post-restoration groundwater impacts."

ASLB May 23, 2014 Order at 9-10.

Thus, the Board found it "had no problem in admitting Contention 2." *Id.*

iii. FSEIS Contention 3 (Admitted)

For the third time, directed at the FSEIS, Joint Intervenors asserted the FSEIS failed to include adequate hydrological information to demonstrate SEI's ability to contain groundwater fluid migration.

NRC Staff began its objection by first acknowledging contention 3 could migrate but, altering course, argued its planned license condition and monitoring requirements would addresses the potential for fluid migration from unplugged boreholes. Staff FSEIS Answer at 21 (citing FSEIS at 4-41-42). SEI, in contrast with the Staff's

[22] SEI again declined an apparent invitation to submit a Summary Disposition Motion on the matter.

acknowledgement that Contention 3 should migrate, alleged "Contention 3 is rife with inaccurate statements and misguided conclusions," SEI FSEIS Answer at 18. Joint Intervenors addressed all of those allegations and more in their reply submitted on May 7, 2014.

The Board migrated contention 3, stating "we see no material change that would preclude this issue statement from again migrating so as to frame a challenge to the FSEIS." ASLB May 23, 2014 Order at 11.

iv. FSEIS Contention 4/5

In light of the uncertain status of the cumulative impacts contention 4/5 after the ASLB's DSEIS ruling, Joint Intervenors filed a motion to migrate or amend the contention – this time directed at the FSEIS – explaining NRC had failed to adequately assess cumulative impacts of the proposed action and the planned Lance District expansion project in the FSEIS. Heeding the Board's admonition to fully address every 2.309(f) and (c) factor, Intervenors explained why the contentions satisfied every factor. Int. Mot. to Migrate or Amend Contentions and Admit New Contentions (Mar. 31, 2014) at 17-19. As to cumulative impacts, Intervenors sought to either migrate their admitted cumulative impacts contention on the ER to the FSEIS, or alternatively to submit an amended or new contention concerning the deficient cumulative impacts analysis in the FSEIS, which mirrored the deficient DSEIS analysis. *Id.* at 15-17; 29-31. The motion included a declaration providing further details on the inadequacies, particularly as regards groundwater, and explaining the failure to meaningfully consider the impacts associated with the entire planned Lance project. *Id.*

The Board denied Intervenors' request to present a cumulative impacts contention on the FSEIS. Order of May 23, 2014 at 12-14. The Board concluded the contention could not migrate from the ER to the FSEIS, because it was not admitted to the DSEIS. *Id.* at 13. As to amendment, the Board likewise found since the FSEIS cumulative impacts analysis mirrored the DSEIS, it was not timely to now present a FSEIS contention on this issue. *Id.* Accordingly, the Board simply continued to include the original contention 4/5A against the ER, but barred either migration or amendment. *Id.*, App. A.

vi. FSEIS Contention 7

As they did in DSEIS stage, Joint Intervenors filed a contention alleging the FSEIS failed to properly define the scope of the proposed major federal action here, which encompasses a much larger project in the same geographic area. The Board rejected this iteration of the contention on similar grounds, that the "only new information presented by Joint Intervenors in support of their current motion that would meet the thirty-day requirement comes from a March 2014 presentation by Peninsula Energy Limited stating that the company is 'constructing a 2.3 [million pounds] per annum ISR operation in 2 stages' with an 'initial mine life [of] 22 years and a 'potential 70+ years of mine life.'" ASLB May 14, 2014 Order at 16 (citation omitted).

vii. FSEIS Contention 8

Joint Intervenors also filed one additional contention, Contention 8, alleging the FSEIS is improperly framed as a Supplemental EIS, rather than a separate EIS tiered from the Generic EIS for In-Situ Leach Uranium Milling Facilities. Specifically, this

contention argued that because NRC did not engage in a scoping process for its environmental review of the Ross Project, but rather proceeded on the premise that it is preparing a *Supplement* to the Generic EIS for In-Situ Leach Uranium Mining Facilities (scoping is not generally conducted for *supplemental* NEPA reviews, *see* 40 C.F.R. 1502.9(c)(4)), NRC failed to follow vital public participation steps and violated NEPA.

Joint Intervenors based their contention on an August 30, 2013 NRC Inspector General report that explained when the agency is preparing an EIS for renewal of a reactor operating license, it conducts full scoping in "tiering" from the Generic EIS on those facilities, preparing site-specific EISs that follow all of NEPA's dictates.[23] But with respect to the material license at issue in this case, NRC is proceeding in this manner "because of incorrect understanding of the regulations related to scoping for EISs that tier off of a generic EIS." *Id*. at 24. In particular, by inappropriately calling the document a "supplement" to the GEIS, NRC has failed to undertake the required scoping process. *Id*.

The Board denied admission of the contention as untimely under 10 C.F.R. § 2.309(c), stating Joint Intervenors could have filed this challenge at the DSEIS stage and that there was no "good cause" bases for delaying such a filing until issuance of the FSEIS. ASLB May 14, 2014 Order at 18.

[23] *AUDIT REPORT: Audit of NRC's Compliance With 10 CFR Part 51 Relative to Environmental Impact Statements*, OIG-13-A-20, August 20, 2013, at 18-26, found online at http://pbadupws.nrc.gov/docs/ML1323/ML13232A192.pdf.

D. Summary Disposition Motions & Board Orders

i. SEI's and Staff's Motion for Summary Disposition on Contention 4/5 – granted

On June 13, 2014 NRC Staff and SEI filed separate Motion for Summary Disposition on Contention 4/5, asserting there was no basis to allow Joint Intervenors' cumulative impacts contention – which was admitted only against the ER, and was never successfully amended or migrated to the DSEIS or FSEIS – to continue to the hearing. Staff Mot. For Summ. Disp. (June 13, 2014); SEI Mot. For Summ. Disp. (June 13, 2014). Staff and SEI argued that since the ER had been superseded by the DSEIS, and then the FSEIS, the challenge to the ER's cumulative impacts discussion was moot. *Id.* SEI further argued that cumulative impacts were fully addressed in the DSEIS and FSEIS. SEI Mot. at 7-8.

Joint Intervenors opposed summary disposition on two grounds. First, they asserted that the contention against the ER was not moot because the issue fits squarely within the well-recognized mootness exception for issues "capable of repetition yet evading review." Jt. Int. Opp. To Summ. Disp. At 11 (July 2, 2014). In particular, they argued the duration of the challenged action is too short to be litigated, since ER contentions are *always* mooted by the subsequent stage in the process, as the EIS is completed before a hearing on the ER is ever convened. *Id.* They also argued that the issue is likely to recur because SEI and Staff's position is that cumulative impacts need not be addressed in an ER. *Id.* at 12.

Second, Joint Intervenors argued that the Board could not resolve whether the ER contention is moot without considering whether, in fact, cumulative impacts were

adequately considered in the DSEIS and FSEIS. And because that issue could not be resolved without addressing disputed factual issues, the matter is not suitable for summary disposition. *Id.* at 15-17.

The Board granted the motion for summary disposition. Order of July 25, 2014. Labeling Joint Intervenors' well-established argument concerning an exception to mootness a "creative argument," the Board concluded that the exception can have no application in these proceedings. *Id.* at 11.

As regards whether the issue remains in dispute sufficiently long enough to be litigated, the Board concluded that since the only category of contentions entitled to be litigated are those that successfully migrate to (or are otherwise raised in connection with) the final NEPA document (here, the FSEIS), by definition such contentions can be litigated at the hearing. *Id.* at 11. Put another way, despite the fact that Joint Intervenors' contention – that an *ER* must meaningfully consider cumulative impacts – is specific *only* to an ER, the Board found that there are no set of circumstances where such a contention could ever be litigated – since, again, only contentions successfully lodged against a NEPA document are entitled to a hearing. *Id.*

Similarly, considering whether the issue is likely to recur – i.e., whether future license applicants are likely to ignore cumulative impacts on the grounds that such an analysis is not required in an ER – the Board, while acknowledging that this was SEI and Staff's position *in this proceeding*, concluded that there is no "reasonable expectation" that the matter would recur since "the applicable staff guidance" requires consideration of cumulative impacts in an ER. *Id.* at 12. Of course, once again, that means this criteria

could *never* be satisfied, since the mootness exception is only implicated where a party is allegedly acting (and will allegedly continue to act) in a manner inconsistent with governing mandates, but where the specific action at issue has been superseded by other events.

The Board also rejected Joint Intervenors' additional argument that this contention cannot be resolved without considering the adequacy of the cumulative impacts analysis in the FSEIS. July 25, 2014 Order at 13. Rather, the Board asserted that there was no need to resolve the adequacy of the cumulative impacts analysis in the FSEIS, because no successful contention had been lodged against it. *Id.*

ii. Joint Intervenors' Motion for Summary Disposition on Contention 1 – denied

On June 13, 2014, Joint Intervenors filed a Motion for Summary Disposition on Contention 1 (failure to adequately characterize baseline (i.e., original or pre-mining) groundwater quality). Jt. Int. Mot. for Summ. Disp. (June 13, 2014). Joint Intervenors asserted that the resolution of contention one turned on one disputed legal issue and two undisputed facts. The legal issue, they contended, was whether applicable regulations *prohibit* SEI and Staff from collecting robust baseline water quality data before the NEPA process is complete and the license issues (as SEI and Staff claim), or whether no such legal bar exists. The undisputed facts are that neither Staff nor SEI has collected the groundwater quality information necessary to establish baselines, nor have such baselines been set.

As Joint Intervenors explained in detail, applicable regulations and guidance unambiguously mandate that robust and scientifically valid baseline water quality

information be collected as part of the NEPA process. *Id.* at 9-11. On the other hand, Joint Intervenors also explained – as the Board itself has repeatedly found – there is no *bar* to the collection of such data pre-license (as SEI and Staff assert). *Id.* at 12-16. And because there is no dispute that such data has not been collected, summary disposition is appropriate. *Id.* at 18.

Staff and SEI opposed summary disposition largely on legal grounds. SEI Answer to Summ. Disp. (July 3, 2014); Staff Answer to Summ. Disp. (July 3, 2014). They thus argued that while they do not dispute the regulatory requirements to establish baseline water quality, the appropriate juncture for collection of such data is *after* license issuance, and that is what the regulatory scheme authorizes. *Id.* They further asserted it would be less effective to collect this data now, rather than closer in time to the anticipated mining activities. Staff Ans. at 16-17.

The Board denied the motion for summary disposition. Order of Aug. 12, 2014. Although Joint Intervenors' legal argument concerned whether Staff and SEI were correct in claiming, as a matter of law, additional water quality information could *not* be collected pre-license (an issue on which the Board had previously agreed with Intervenors), the Board reframed the argument in a manner that allowed for its rejection. *Id.* at 18-19. In particular, the Board found dispositive the fact that Joint Intervenors were not asserting that the "*entire* groundwater monitoring network" must be developed as part of the NEPA process, *id.* at 18 (emphasis in original), finding that this led inexorably to the conclusion that there are disputed facts as to whether the groundwater data Strata and SEI had included in the FSEIS was adequate. *Id.* 18-19.

Approaching the issue in this manner, the Board did not definitely resolve the legal question Joint Intervenors posed – *i.e.*, whether applicable regulatory requirements *bar* Strata and Staff from collecting additional baseline water quality information pre-license. Rather, the Board's decision seems to indicate that even if (as Joint Intervenors contend) there is no such bar, the Board must nonetheless resolve whether the water quality information contained in the FSEIS is adequate.[24]

Moreover, the Board helpfully distilled ten discrete alleged deficiencies with the FSEIS's treatment of this issue, which Joint Intervenors will establish at the hearing. *Id.* at 19-21. Those issues are all addressed in the direct testimony of Dr. Abitz. JTI001.

E. Contentions for Adjudicatory Hearing on the Merits

As a consequence of the resolution of the summary disposition motions, only the first three contentions that remained after the FSEIS will be heard at the hearing. Thus, the final contentions for the hearing are as follows:

> **Environmental Contention 1**: The FSEIS fails to adequately characterize baseline (i.e., original or pre-mining) groundwater quality.

CONTENTION: The FSEIS fails to comply with 10 C.F.R. §§ 51.90-94, 10 C.F.R. Part 40, Appendix A, and NEPA because it lacks an adequate description of the present baseline (i.e., original or pre-mining) groundwater quality and fails to demonstrate that groundwater samples were collected in a scientifically defensible manner, using proper sampling methodologies. The FSEIS's departure from NRC guidance serves as additional evidence of these regulatory violations. NRC, NUREG-1569, Standard Review Plan for In Situ Leach Uranium

[24] In Joint Intervenors' view it would not have been necessary for the Board to resolve that factual issue if it had resolved – in Joint Intervenors' favor – Staff and SEI's argument that there is no more they could do at this time, since both the applicant and Staff *have always conceded that much more work needs to be done to adequately characterize and establish baselines for water quality*. In short, if the Board had agreed with Joint Intervenors' legal assertions that NEPA *requires* this information, and it *could* be collected during the NEPA process, it remains unclear what would need to be resolved at the hearing. However, in light of the Board's ruling Joint Intervenors will demonstrate that, under *any view* of the legal requirements, the FSEIS's treatment of baseline water quality falls far below NEPA's minimum requirements.

Extraction License Applications, §§ 2.7.1, 2.7.3, 2.7.4 (2003).

> **Environmental Contention 2**: The FSEIS fails to analyze the environmental impacts that will occur if the applicant cannot restore groundwater to primary or secondary limits.

CONTENTION: The FSEIS fails to meet the requirements of 10 C.F.R. §§ 51.90-94 and NEPA because it fails to evaluate the virtual certainty that the applicant will be unable to restore groundwater to primary or secondary limits in that the FSEIS does not provide and evaluate information regarding the reasonable range of hazardous constituent concentration values that are likely to be applicable if the applicant is required to implement an Alternative Concentration Limit (ACL) in accordance with 10 C.F.R. Part 40, App. A, Criterion 5B(5)(c).

> **Environmental Contention 3**: The FSEIS fails to include adequate hydrological information to demonstrate SEI's ability to contain groundwater fluid migration.

CONTENTION: The FSEIS fails to assess [adequately] the likelihood and impacts of fluid migration to the adjacent groundwater, as required by 10 C.F.R. §§ 51.90-94 and NEPA, and as discussed in NUREG-1569 § 2.7, in that:

1. The FSEIS fails to analyze sufficiently the potential for and impacts associated with fluid migration associated with unplugged exploratory boreholes, including the adequacy of applicant's plans to mitigate possible borehole-related migration impacts by monitoring wellfields surrounding the boreholes and/or plugging the boreholes.

2. There was insufficient information for the NRC staff to make an informed fluid migration impact assessment given that the applicant's six monitor-well clusters and the 24-hour pump tests at four of these clusters provided insufficient hydrological information to demonstrate satisfactory groundwater control during planned high-yield industrial well operations.

IV. PRESENTATION OF EVIDENCE AND DEMONSTRATION OF FAILURE TO COMPLY WITH NEPA

A. Joint Intervenors' Witnesses

During the hearing, Intervenors' will offer two witnesses in support of Contentions 1, 2 and 3. These witnesses are Drs. Lance Larson and Richard Abitz, both of whom have submitted pre-filed testimony supporting the contentions. *See* JTI003 and

JTI001, respectively. Their professional and educational qualifications are described in their respective *curriculum vitae*'s. JTI002 and JTI004. Both Dr. Larson and Dr. Abitz's testimony and opinions related to Joint Intervenors' Contentions 1, 2 and 3 are based on upon their respective technical expertise in, and experience with, the relevant issues.

Dr. Larson has a dual doctorate in environmental engineering and biogeochemistry. He has both practical and academic experience in the uranium field. Dr. Larson has been working at NRDC since January.

Dr. Abitz is a geologist and geochemist with more than twenty-five years of domestic and international experience in conducting and managing environmental work associated with the restoration of groundwater and soil contaminated by uranium and other radionuclides. Over his career, he has been retained by private, government, and nonprofit clients in a variety of areas to provide consultation and expert testimony associated with such environmental work. He is well-qualified to provide expert testimony related to the contentions.

B. Summary of Joint Intervenors' Evidence

The testimony, facts, and evidence provided by Dr. Larson and Dr. Abitz, as described in detail in their pre-filed testimony and briefly here, demonstrate that SEI and NRC Staff have demonstrably failed to comply with NEPA's mandate to take the requisite "hard look" at the environmental impacts of ISL uranium recovery.

Specifically, Drs. Abitz and Larson demonstrate that: (1) adequately characterizing baseline groundwater quality is crucial to a sound, meaningful NEPA analysis and, just as important, can be performed in a technically defensible manner that

will allow the public and decision-makers to understand the environmental impacts and risks posed by the uranium mining operations before the agency decision is taken; (2) the NRC staff did not adequately assess the impacts stemming from the high likelihood that the Lance District will remain contaminated at the conclusion of the restoration process and the information added to the FSEIS on other sites does not and cannot fulfill Staff's NEPA obligation to disclose the likely outcome – including, at minimum, a bounding analysis of likely results – at this site; and (3) the FSEIS was technically inadequate because it (a) failed to disclose and assess the high risks of fluid migration from unplugged boreholes that fundamentally compromise the assumption of confined (and therefore non-contamination transporting) aquifers, (b) was based on SEI's pump tests that were inadequate to demonstrate aquifer confinement, and (c) did not require the use of excursion parameters likely to detect uranium excursions when they occur.

i. Evidence Supporting Contention 1

Dr. Abitz is the main expert witness for Joint Intervenors in support of their Contention 1, which demonstrates that the FSEIS failed to adequately characterize baseline (i.e., original or pre-mining) groundwater quality. In his pre-filed testimony, Dr. Abitz explains how a technically sound "baseline" can be established and why what SEI and NRC Staff have done do not meet those standards.

Dr. Abitz begins his testimony with a discussion of what it means to have "baseline" water quality established in an underground aquifer and how the terms are commonly understood by industry and government regulators JTI001 at ¶¶11-15. Fundamentally, he explains the critical need for a precise knowledge of baseline

groundwater quality to understand the environmental impacts at a site where natural resource extraction activities are going to take place so as to understand as best one can the condition of the aquifer before any anthropogenic activity that might cause contamination takes place so proper monitoring levels can be established to protect the groundwater. *Id* at ¶15. He then explains that for hazardous waste sites, baseline values are established for the groundwater horizons by installing wells, under approved procedures and valid statistical sampling plans, upgradient of known or suspected contamination zones, with sampling occurring more than 8 times. *Id*. at ¶¶12-14 (*citing* EPA (2009) Unified Guidance (JTI 006, at 5-3).

Dr. Abitz then explains that the process for collecting baseline groundwater quality data for the Ross Project is not consistent with the standard, scientifically defensible approach to setting baseline water quality, as the FSEIS provides that two separate efforts to evaluate baseline water quality data will occur, one pre-license and another post-license, with almost all the data collection and the actual setting of baselines only post-license, after the regulatory decision is made. *Id.* at ¶16. This arbitrary splitting of the baseline collection process until after the licensing and environmental evaluation of the facility is problematic, he explains, because (1) to collect samples that represent the true geochemical conditions in the aquifer, the baseline must be established using groundwater samples obtained from an aquifer that has not been contaminated by extensive exploration drilling; (2) allowing contamination of the aquifer prior to establishing baseline is contrary to the scientific definition of baseline and the noted criteria in 10 C.F.R. 40 Appendix A; and (3) failure to develop and present the actual

baseline conditions on the site deprives the public and the decision-maker any meaningful evaluation of the project's likely environmental impacts. *Id*. at ¶¶17, 18.

Thus, Dr. Abitz concludes that under the FSEIS sanctioned approach for this project, baselines are not actually evaluated and established before the decision to go ahead with the project has been made. Allowing baseline data collection post-license, Dr. Abitz explains, is problematic because it likely means that the groundwater quality will not be characterized properly, resulting in the establishment of high excursion values and restoration standards that will preclude the use of the water for future domestic, livestock or agriculture needs. *Id*.

Dr. Abitz explains in detail how this will happen, after briefly describing what SEI and NRC Staff have done to establish what they call "background water quality described in the FSEIS. *Id*. at ¶21. Dr. Abitz provides a roadmap to the specific flaws and the discussion in depth. *Id*. at ¶22.

First, Dr. Abitz explains the statistical justification for the location of the six monitoring-well clusters is lacking because the wells were not randomly located, the ore zone was oxidized when the wells were installed, and the screen lengths for the existing monitor wells were inappropriate. *Id*. at ¶¶22-26. This, he demonstrates, has the effect of biasing groundwater samples to high values for uranium. *Id*.

Dr. Abitz explains a true baseline cannot be developed after hundreds to thousands of wells are drilled in the well fields. *Id*. at¶¶27-29. Dr. Abitz details that allowing contamination via extensive exploration programs that use oxidizing fluids during drilling operations and the installation of hundreds of wells with rotary-drill

techniques that use oxidizing fluids and air-lifting techniques during well development will result in misleading baseline results. He also explains that SEI will collect baseline samples from the most disturbed and contaminated portion of the aquifer that has been oxidized by above described techniques, resulting in more misleading results. *Id*. at ¶¶18, 25-31. In his testimony, Dr. Abitz relates his experience with the Kingsville Dome site in Texas, which suffered from similar technical flaws. *Id.* at ¶¶30-31.

In regard what sampling has occurred pre-license, Dr. Abitz explains why it is not sufficient to provide the meaningful baseline analysis that should be included in the FSEIS. *Id*. at ¶¶23, 26-27. He describes why the SEI sampling methods do not establish scientifically valid baseline water quality conditions. For instance, Dr. Abitz explains that the sampling program was much too limited, relying on only six well clusters and some other existing data in the FSEIS. *Id.* He also explains historical impacts and FSEIS's plan for extensive mechanical and chemical disturbance of the aquifer prior to collecting baseline water-quality samples bias baseline values to high concentrations. *Id*. at ¶¶25-32. In contrast to all that he has shown, Dr. Abitz then describes how baseline groundwater can be accurately portrayed via scientifically defensible methods. *Id*. at ¶¶33-36.

Dr. Abitz summarizes his testimony in support of Contention 1 by concluding that the NRC has failed to disclose the actual environmental impacts of the Ross Project in two crucial respects: (1) by relying on only the six well clusters and some other existing data in the FSEIS, rather than establishing scientifically and statistically valid baseline water quality parameters, the NRC has failed to disclose or consider the actual baseline water quality conditions in the area comprising its licensing decision; and (2) in light of

the fundamental deficiencies associated with the approved plans to collect post-licensing 'baseline' water quality data, the NRC has failed to disclose or consider how much worse the water quality in the area is likely to become post-restoration, as compared to baseline conditions, thus failing to confront and disclose the inevitable fact the actual environmental impact of the Ross Project on water quality will be "large" as defined by the NRC – i.e., "clearly noticeable and sufficient to destabilize important attributes of the resource considered." *See* SEI009A, FSEIS at xxi.

ii. Evidence Supporting Contention 2

Dr. Larson is the main expert witness supporting Joint Intervenors' Contention 2, which is based on the FSEIS failing to analyze the environmental impacts that will occur if the applicant cannot restore groundwater to primary or secondary limits.

In his pre-filed testimony, Dr. Larson explains, based upon the past history of ISL facilities, it is a virtual certainty that SEI will not be able to restore the impacted aquifers to primary or secondary limits. Even with ACLs approved by NRC, Dr. Larson explains, past ISL projects have resulted in significant impacts to aquifers and to date, no ISL project has successfully restored an aquifer. After reviewing extensive restoration data from other ISL projects, he concludes that the likelihood of similar impacts occurring at the Ross Project have not been adequately assessed in the FSEIS.

Dr. Larson first describes the ISL uranium recovery process, the basics of underground aquifers, and, briefly, how aquifer restoration takes place. JTI003 at ¶¶5-11. Dr. Larson then describes the FSEIS's discussion of aquifer restoration, addressing each example provided by Staff in turn: Nubeth (*Id*. at ¶¶12-15), Crowe Butte (*Id*. at ¶16),

Smith Ranch/Highlands Wellfield A (*Id*. at ¶¶17) and Irigaray Mine Units 1-9 (*Id*. at ¶¶18-19). Dr. Larson concludes that NRC Staff and the applicant have neither established an adequate baseline nor addressed the certain and degrading impact to groundwater resources when alternative concentration limits are set after restoration fails. *Id*. at ¶20. Next, Dr. Larson looks with detail at Christensen Ranch, mine unit 4, where a restoration plan similar to that at Ross has been approved. *Id*. at ¶¶21. There he finds severe contamination of the groundwater occurred while following the standard NRC groundwater restoration plan – i.e., the one approved at Ross and ostensibly analyzed in the FSEIS. *Id*. at ¶22-23. Thus, Dr. Larson concludes that based on the examples the NRC cites in the FSEIS, the Christensen Ranch results shown above, and examples he provides later in the testimony, it is his professional opinion that it is inconceivable that the Ross Project will have a "SMALL and Temporary" impact on groundwater quality, as the FSEIS concludes (SEI009A, at xxx). To the contrary, he asserts, if the FSEIS were to consider the actual baseline conditions on the site and compare those values to the reasonably anticipated conditions post-restoration, the FSEIS would disclose that the Ross Project will have significant environmental impacts. Finally, Dr. Larson discusses criteria such as adequate timeframes for restoration and their relationship to evaluate the virtual certainty an Alternative Concentration Limit (ACL) will be required. *Id*. at ¶24.

Next, Dr. Larson introduces visual representations of NRC ISL uranium recovery data to illustrate the failure of restoration at ISL uranium recovery sites and the kind of meaningful analysis necessary to meet the requirements of 10 C.F.R. §§ 51.90-94 and

NEPA in the likely event the applicant will be unable to restore groundwater to primary or secondary limits.

Specifically, Dr. Larson presents Storymap #1, *A Visual Representation Of The Failure to Restore Contaminated Groundwater at a Selected Portion of the Willow Creek ISL Uranium Mining Site* and Storymap #2, *A Visual Representation Of The Failure to Restore Contaminated Groundwater & Depiction of Near-Surface Contamination at a Selected Portion of the Smith Ranch ISL Uranium Mining Site*. *See* JTI005. In short, Dr. Larson's Storymaps are a visual, interactive representation of spatial data coupled with detailed descriptions of the significance of the data. He explains that if a user is shown a static map or a spreadsheet, without context or the ability to interact, it is much more difficult to assimilate the information. JTI003 at ¶25. Dr. Larson then explains in detail how he created the Storymaps, where he obtained the underlying data (from the NRC), how a user can link to the data, and how his conclusions can be duplicated or reproduced. *Id*. at ¶¶26-40. Dr. Larson provides the links to the Storymaps and then describes in detail what the user sees and how to access the relevant information, with thorough descriptions of the baseline tab and the information associated with the post restoration tab. *Id*. at ¶¶41-51.[25]

Showing one example of what the Willow Creek Storymap can illustrate, Dr. Larson examines well 2AI30 in mine unit 2 where the baseline value presented is 0.02 mg/L. *Id*. at ¶¶52-54. He then describes how the user can find the corresponding uranium concentrations post-restoration (Sampling Rounds 1-4 were 0.207, 0.113, 0.263, 0.25

[25] The storymaps can be located here: http://isl-uranium-recovery-impacts-nrdc.org/Willow-Creek/; and http://isl-uranium-recovery-impacts-nrdc.org/Smith-Highland/

mg/L). He states these values become apparent when you 'scroll' over the columns with the mouse cursor (he shows round 3 in his screen shot). *Id*. at ¶¶55-56. He then states that at this well after active restoration, the lowest observed uranium concentration (0.113 mg/L) was approximately 5x higher than the average baseline concentration (0.0223 mg/L) and approximately 3.8x higher than safe drinking water standards (0.03 mg/L). *Id*. After providing another example where the observed groundwater uranium concentrations can only be described as extreme (18.0, 20.7, 21.7, and 14.8 mg/L, which were 600 times, 690 times, 723 times, and 493 times average baseline and safe drinking water standards, respectively, (*Id*. at ¶57), Dr. Larson encourages the reader to select various wells to observe specific impacts.

Finally, Dr. Larson provides a meaningful summary of the data in the Storymap. Using the entire wellfield data set from Christensen Ranch MU2-6, he created a cumulative histogram for average baseline and each post restoration phase sampling round concentrations. *Id.* at ¶58. Ultimately for the Willow Creek Storymap, the majority of the average baseline groundwater samples were below the MCL for uranium of 0.03 mg/L (~65%); 28 % had slightly elevated uranium concentrations (0.03-0.09 mg/L) and only 8% were very elevated (0.09 – 3.0 mg/L). Dr. Larson then showed that after mining and restoration activities, the groundwater quality sample distribution shows significant changes to these observed percentages. Roughly 13% of the post restoration samples were extremely contaminated (greater than 3.0 mg/L, which is greater than 100 times the EPA's maximum contaminant limit for safe drinking water standards for uranium), the 'very elevated' uranium concentrations increased from 8% (Baseline) to 59% (Post-

restoration). And finally, the drinking water quality samples decreased from approximately 2/3 of all samples, to roughly 18% of the observed samples. *Id*. Dr. Larson's analysis demonstrates, quantitatively, the severe water quality degradation which occurs as a result of ISL mining, which is not disclosed or discussed in the FSEIS. He finally notes that the total amount of groundwater impacted from ISL mining at Christensen Ranch mine unit 2-6 was estimated by industry as 1.04 billion gallons of groundwater. *Id*. at ¶59.

Dr. Larson then explains how these results illustrate the potential impacts to the groundwater from the Ross project and the definitive need to evaluate information regarding the reasonable range of hazardous constituent concentration values that are likely to be applicable if the applicant is required to implement an Alternative Concentration Limit (ACL). *Id*. ¶¶59, 66. He goes on to note that groundwater restoration techniques and pore volume requirements at this mine unit followed the same progression as described by the NRC staff for the Ross Project (FSEIS; p.2-35 – p. 2-37) with a far shorter active groundwater restoration time frame of 8 months (FSEIS at 2-35). Similar or worse, groundwater degradation at the Ross project is virtually inevitable and such impacts have not been meaningfully analyzed in the FSEIS. *Id*. ¶60.

Dr. Larson then turns to the second Storymap, Smith Highland Mine Units A and B. Without walking the reader through the same steps to learn to use the Storymap, he again describes what the user can see and how he compiled the NRC's data. *Id*. at ¶61. Looking at one example, well MP20, he found the average uranium baseline concentration was 0.04 mg/L, suggesting the last and lowest uranium concentration

observed post-restoration was ten times higher than the baseline and roughly twelve times higher than safe drinking water standards (0.03 mg/L). *Id.* at ¶¶62-65. Dr. Larson concludes by stating that based on the examples the NRC cites in the FSEIS, the Christensen Ranch results discussed earlier in his testimony, and the clear visual representation that are the Storymaps, it is his professional opinion that it is inconceivable that the Ross Project will have a "SMALL and Temporary" impact on groundwater quality, as the FSEIS concludes. To the contrary, if the FSEIS were to consider the actual baseline conditions on the site and compare those values to the reasonably anticipated conditions post-restoration as evidenced by the Storymaps and the underlying NRC data, the FSEIS would disclose that the Ross Project will have significant environmental impacts. *Id*. ¶66.

Essentially, Dr. Larson has explained in detail why the NRC Staff use of cherry-picked data from other ISL projects is not remotely sufficient to assess the likelihood of contamination at the Ross Project. He demonstrates the data selected by the NRC Staff for the FSEIS was neither comprehensive nor representative of ISL projects impacts. It is apparent from Dr. Larson's testimony that if one looks at a comprehensive set of restoration data for those projects – such as the Storymap for Willow Creek – the only valid conclusion is that restoration was not successful and the projects resulted in significant impacts to the aquifer. Most importantly, no meaningful "bounding analysis" of likely impacts has been performed for this project. *Id.* at ¶¶66, 12, 23.

iii. Evidence in Support of Contention 3

Both Dr. Abitz and Dr. Larson will serve as expert witnesses providing testimony in support of Joint Intervenors' Contention 3, which provides that the FSEIS failed to include adequate hydrological information to demonstrate SEI's ability to contain groundwater fluid migration.

Dr. Abitz details three main flaws in the NRC Staff's analysis in the FSEIS in regard to fluid migration. First, the FSEIS discounts the risk of fluid migration from thousands of unplugged and improperly abandoned exploration boreholes. Second, by relying upon pump tests that were inadequate to demonstrate aquifer containment, the FSEIS did not properly assess the risk of fluid migration. Third, the FSEIS's impacts analysis is inaccurate in concluding that other contaminants will serve as more accurate excursion indicators than uranium itself.

As to the first point, Dr. Abitz explains that the FSEIS does not fully assess the risk of fluid migration from improperly plugged and abandoned boreholes because the NRC relies upon data supplied by SEI without doing independent analysis of the likelihood of more wells. JTI001 at ¶¶41-42 Even then, Dr. Abitz explains, the data supplied by SEI is conflicting and has not been verified by NRC. *Id.* Dr. Abitz also details that the FSEIS under-assesses the risk of these wells because it relies upon the unfounded assumption that SEI will locate and plug *all* wells prior to wellfield development. *Id.* Even assuming this will occur as planned – and, as Dr. Abitz explains, the history of the applicant's efforts to date have not rendered promising results – Dr. Abitz concludes that in order to accurately mitigate the risk, the FSEIS must also present

a clear discussion of the time table and requirements to locate, plug and abandon the boreholes before any wellfield is developed. He illustrates this point with evidence that license conditions requiring boreholes be properly plugged have not necessarily led to satisfactory environmental results. *Id*. at ¶41.

As to the second point, Dr. Abitz explains that "neither the number of wells tested for hydrological parameters nor the short duration of the pump tests run to date establish adequate hydrological information to demonstrate control of groundwater." *Id.* at ¶¶43-46. He explains that the FSEIS does not present scientifically defensible analysis, including detailed engineering analysis, necessary to assess the control of mining fluids during industrial-scale ISL operations. *Id*.

As to the third point, Dr. Abitz details that uranium should be included as an excursion parameter and that by not including it, the FSEIS fails to properly mitigate the risk of excursions during the project's operations. Dr. Abitz states that by not including uranium as an excursion parameter, "the FSEIS skews the analysis and likelihood for detected excursions in a manner that fundamentally undermines the conclusions about the environmental impacts of the project on groundwater quality." *Id*. at ¶¶38-40. Dr. Abitz concludes his support for Contentions 1 and 3 with a brief explanation of the importance of properly establishing baseline groundwater quality and including adequate hydrological information to demonstrate SEI's ability to contain groundwater fluid migration. *Id*. at ¶47.

In his pre-filed testimony, Dr. Larson states that "the FSEIS has failed to sufficiently analyze the potential for and impacts associated with vertical fluid migration,

and unidentified or unsealed drillholes between aquifer units." JTI003 at ¶67. Specifically, Dr. Larson reviews the information in the FSEIS demonstrating that SEI has failed to locate over 1,000 wells, let alone properly plug them, and therefore the risk of fluid migration during the Ross Project is extremely high. *Id*. at ¶¶69-75. Dr. Larson also expresses a fundamental disagreement with the NRC over how it interprets basic geochemical interactions that will take place in the subsurface when efforts to establish baseline are commenced and, more important, when mining commences. *Id*. ¶¶67-68.

Dr. Larson also reviews excursion problems at other ISL facilities, which have regularly occurred, and explains that it is "difficult to assess whether an aquifer is truly confined." *Id*. at ¶¶69-70. Dr. Larson then presents a Storymap related to the excursion history of the Willow Creek facility. *Id*. at ¶¶76-85. He notes that one facility has suffered from both vertical and horizontal excursions, with vertical excursions being particularly difficult to correct. According to the data Dr. Larson reviews, some wells remained on "excursion status" for months and even years. *Id*. at ¶81. Dr. Larson also reviews excursion data at the Smith Highland Ranch facility. *Id*. at ¶¶82-85.

Dr. Larson concludes with a brief explanation why extensive groundwater degradation matters so much both regionally and specifically for eastern Wyoming. *Id*. at ¶¶86-88. Dr. Larson finally asserts that the FSEIS underestimated the risk of fluid migration by improperly determining that the aquifer is confined. He states that "[i]n the FSEIS and license for the Ross ISL project the NRC Staff has approved the same groundwater restoration methods which have failed to meet baseline and/or safe drinking

water standards at every previous ISL site, and for technical and scientific reasons, will not result in groundwater quality meeting primary or secondary standards." *Id*. at ¶89.

V. CONCLUSION AND PRAYER FOR RELIEF

For the foregoing reasons, Joint Intervenors request that this Board enter an order providing the following relief:

1) Declare that NRC staff violated NEPA in approving the FSEIS and subsequent license for SEI's Ross Project;

2) Require NRC staff to correct the legal deficiencies in its FSEIS created by the NEPA violations;

3) Vacate the Ross License and Enjoin the Ross Project until such deficiencies are corrected; and

4) Grant any such further relief that the Board may consider to be just and proper.

Respectfully submitted,

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Date: August 25, 2014

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing *Natural Resources Defense Council's & Powder River Basin Resource Council's Statement Of Position Supporting Environmental Contentions 1, 2 and 3* and accompanying attachments in the above-captioned proceeding were served via the Electronic Information Exchange (EIE) on the 25th day of August 2014, which to the best of my knowledge resulted in transmittal of same to those on the EIE Service List for the captioned proceeding.

Geoffrey H. Fettus (electronic signature)

Date: August 25, 2014