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)	)	November 17, 2014

NATURAL RESOURCES DEFENSE COUNCIL'S & POWDER RIVER BASIN RESOURCE COUNCIL'S RESPONSES TO NRC STAFF'S AND SEI'S PROPOSED FINDINGS OF FACT & CONCLUSIONS OF LAW FOR ENVIRONMENTAL CONTENTIONS 1, 2 AND 3

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I. INTRODUCTION

1. In accordance with 10 C.F.R. §§ 2.1204(b) and 2.1207 and this Atomic Safety and Licensing Board's ("ASLB" or "Board") Orders of July 25, 2014, August 7, 2014, and directions at the close of the evidentiary hearing held in Gillette, Wyoming on September 30, 2014 and October 1, 2014 ("Hearing"), Intervenors Natural Resources Defense Council and Powder River Basin Resource Council ("Joint Intervenors") hereby submit responses to the proposed findings of fact and conclusions of law on Environmental Contentions 1, 2 and 3 for the Ross In Situ Recovery Project in Crook County, Wyoming ("Ross Project") submitted by Strata Energy, Inc. ("Strata," "SEI" or "Applicant") and the United States (U.S.) Nuclear Regulatory Commission ("NRC") Staff. (hereafter "SEI FOF/COL" and "Staff FOF/COL").

2. Staff's and SEI's assertions that after consideration of all relevant evidence in the record, the Board should dismiss Contentions 1, 2, and 3 and affirm that the NRC Staff and Strata have met their burden of demonstrating that the Final Supplemental EIS ("FSEIS" or "SEIS") for the Ross Project complies with the dictates of the National

Environmental Policy Act ("NEPA") and implementing regulations have no merit. *See* Staff FOF/COL ¶1.2; SEI FOF/COL ¶1.2. For the reasons set forth in their November 3, 2014 *Proposed Findings of Fact & Conclusions of Law* (hereafter "JTI FOF/COL") and today's *Proposed Response to NRC Staff's and SEI's Proposed Findings of Fact and Conclusions of Law*, Joint Intervenors urge the Board to find the FSEIS and associated environmental review for the Ross Project fails to comply with the National Environmental Policy Act ("NEPA"), 42 U.S.C. 4321, *et seq.*, and applicable regulations, and on that basis find in favor of Joint Intervenors on all three contentions, vacate the Ross Project Record of Decision ("ROD") and license, and remand the matter to the NRC Staff.[1]

II. LEGAL STANDARDS

3. As described in detail in this section, Staff (at ¶4.1 - ¶5.22) and SEI's (at ¶3.1 - ¶9.2) treatment of the legal standards applicable to this proceeding fundamentally misstate and truncate the legal framework on which Joint Intervenors' contentions are premised. These errors lead Staff and SEI to propose factual findings and legal conclusions for this proceeding that the Board must reject, as discussed in the sections that follow.

4. Staff, SEI and Joint Intervenors concur on some basic, well established NEPA law, including that NEPA governs the Staff's review of the Ross Project, and requires an Environmental Impact Statement ("EIS"), or, where applicable a Supplemental EIS

[1] Joint Intervenors address those findings with specific legal impact or those that lack any evidentiary support. Failure to address any single specific proposed finding does not necessarily signify concurrence. Rather, it signifies that its assertion or conclusion is either addressed elsewhere in the text of this document or it is irrelevant to the legal and factual conclusions the Board should find. Specifically, many of NRC Staff and SEI's proposed findings have nothing to do with the material issue at hand – whether the Ross Project FSEIS meets the requirements of NEPA.

("SEIS"), for any major federal action with significant environmental impacts. 42 U.S.C. § 4332; 40 C.F.R. §§ 1500.1, 1502.9; *Dept. of Transp. v. Pub Citizen*, 541 U.S. 752, 756 (2004).

5. Staff and SEI, however, omit in their entirety the Council on Environmental Quality ("CEQ") regulations. They are not mentioned at all by Staff, while SEI claims the CEQ regulations are irrelevant, arguing that they are not binding on the NRC as "an independent regulatory agency." SEI FOF/COL ¶5.5. However, SEI fails to cite any legal authority for its proposition, and, in fact, it is well-established that the CEQ regulations *are binding on all federal agencies including the NRC*, and thus govern the preparation of the SEIS at issue in this proceeding. 40 C.F.R. § 1500.3 ("Parts 1500 through 1508 of this title provide regulations applicable to and binding on all Federal agencies...except where compliance would be inconsistent with other statutory requirements" and "The provisions of the Act and of these regulations must be read together as a whole in order to comply with the letter and spirit of the law."). Staff and SEI are unable to cite any such "inconsistent" *statutory requirement* that might serve to justify the Staff's instant failure to comply with NEPA and the corresponding CEQ regulations. *See also* 40 CFR § 1500.6 ("The phrase 'to the fullest extent possible' in section 102 [of the Act] means that each agency of the Federal Government shall comply with that section *unless existing law applicable to the agency's operations expressly prohibits or makes compliance impossible."*). In other words, since the CEQ regulations are consistent with the Atomic Energy Act and NRC's own NEPA regulations, NRC is bound by them and must fulfill their requirements in the SEIS. *See also, 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).[2] Moreover, contrary to SEI's assertion, SEI FOF/COL ¶ 5.5, 10 C.F.R. Part 51 does not represent the Commission's interpretation of the CEQ regulations but rather its own separate implementing NEPA regulations, and the agency – like all agencies – must comply with *both* the CEQ regulations and its own regulations implementing NEPA. *See* 40 C.F.R. § 51.1(a) (stating that Part 51 regulations implement NEPA); *see also, e.g. Cnty. of Rockland, N.Y. v. F.A.A.*, 335 F. App'x 52, 55 (D.C. Cir. 2009) (applying *both* the CEQ and an agency's own implementing NEPA framework).

6. The CEQ 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) and "the environmental impacts of the alternatives including the proposed action." *Id.* § 1502.16. Further, the CEQ regulations require agencies to "insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements." *Id*. § 1502.24. "If an agency requires an applicant to submit environmental information for possible use by the agency in preparing an environmental impact statement" (as applies in this case), then "the agency shall independently evaluate the information submitted and shall be responsible for its accuracy." *Id.* § 506.5(a). The analysis of environmental impacts must be "*of high quality*" and "[a]ccurate scientific analysis [is] essential to implementing NEPA." 40 C.F.R. § 1500.1(b) (emphasis added).

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[2] *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. As a result of ignoring the binding CEQ framework, Staff and SEI also fail to acknowledge that environmental impacts, also called "effects," include "ecological effects" "such as effects on natural resources and the components, structures, and functioning of affected ecosystems." *Id.* at § 1508.8(b); *see also id.* (effects include the "effects on air and water and other natural systems, including ecosystems"). This is especially pertinent with respect to Joint Intervenors' contentions demonstrating that Staff has effectively ignored the impacts to the mined aquifer. *See* JTI FOF/COL ¶¶ 114-127. Notably, effects also include "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.

8. Staff and SEI also omit in their entirety CEQ Section 1500.1(b), providing that "NEPA procedures must insure that environmental information is available to public officials and citizens *before* decisions are made and before actions are taken." *Id.* at §1500.1(b) (emphasis added). As the regulations emphasize, "[e]nvironmental impact statements shall serve as the means of assessing the environmental impacts of proposed agency actions, *rather than justifying decisions already made*." *Id.* at § 1502.2(f) (emphasis added). This requirement is particularly relevant to the Staff's purported discretion to defer a complete and scientifically defensible baseline water quality analysis to the "post-licensing" stage – *i.e.* when the decision is "already made" – and to the failure of the FSEIS to include an analysis of the environmental impacts on the Ross Project environs of the Commission's "reasonably foreseeable"—indeed, certain—action of granting an ACL to conclude SEI's proposed aquifer "restoration" effort.

9. In reciting the legal standards – and, indeed, throughout its findings in their entirety – NRC Staff also omits several of its *own* binding regulations. This presumably deliberate failure indicates the degree to which Staff has abandoned its obligations under NEPA to fully consider the environmental implications of this project. The NRC's own implementing regulations for the environmental review process impose requirements similar to those of CEQ. As Staff notes (at ¶4.5) the regulations that provide the environmental review process begins with the applicant's Environmental Report ("ER"), which contains the applicant's effort to address the issues that must be covered in the NEPA process. 10 C.F.R. § 51.45. However, Staff omits discussion entirely of the regulatory mandates for its work in preparing a Draft EIS, *id.* at § 51.71 (discussed at length in JTI FOF/COL at ¶36), and then a Final EIS. *Id.* at § 51.90. The NRC 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). For its part, SEI neglects to include any detailed discussion of NRC's NEPA regulations and instead speaks generally to the 10 CFR Part 51 regulations. SEI FOF/COL ¶5.5.

10. While the parties concur as to the burden of proof here (*see* Staff FOF/COL ¶¶5.1-5.2; SEI FOF/COL ¶4.2; JTI FOF/COL ¶22), Staff and SEI erroneously suggest that in meeting their burden, they can rely on information that is not accurate, timely or without scientific basis. *See, e.g.* Staff FOF/COL ¶5.5 (arguing that NEPA does not require certainty or precision or the use of the best methodology, and the Staff need not prove, and this Board need not find, that its results are the most accurate or were performed with the best methodology); SEI FOF/COL ¶5.9 (arguing that "NEPA analyses often must rely upon imprecise and uncertain data" and "NEPA allows agencies 'to select their own methodology as long as that methodology is reasonable.'" (internal citations omitted)). To the contrary, NEPA requires that "the agency shall independently evaluate the information submitted and shall be responsible for its accuracy," 40 C.F.R. § 506.5(a), and the analysis of environmental impacts must be "of *high quality*." *Id.* § 1500.1(b) (emphasis added) ("Accurate scientific analysis [is] essential"). As discussed in Joint Intervenors' Proposed Findings, there are clear scientific principles that apply to key issues of contention in this proceeding, including, for instance, establishment of baseline water quality, that were not employed by NRC and SEI.

11. Instead, NRC Staff and SEI attempt to downplay these requirements by hiding behind NEPA cases that speak to a "rule of reason" and "uncertainty." *See, e.g.*, Staff FOF/COL ¶¶4.2-4.4; SEI FOF/COL ¶¶5.7-5.9. These cases, however, concern projects where it was difficult, if not impossible, to obtain additional certainty or data to evaluate environment impacts. *E.g. Ground Zero v. U.S. Navy*, 383 F.3d 1082, 1090 (9th Cir. 2004) (rejecting arguments for additional analysis of an "infinitesimal" environmental impact). Here, by

contrast, there is no dispute between the parties that additional data *can be collected* to evaluate the three issues presented in this hearing – baseline water quality, impacts to water quality post-restoration, and aquifer confinement. Instead, the dispute is whether that data may be collected and considered *after* the NEPA process is complete and the license is issued, or rather must be incorporated into the NEPA decision-making process.

12. In defense of the chosen approach, Staff claims that "the precise Commission-approved background values need only be established prior to commencement of licensed operations, and that the establishment of these values prior to issuance of a license is in fact precluded by the Commission's Construction Rule, 10 C.F.R. § 40.32(e)." Staff FOF/COL ¶5.8; *see also* SEI FOF/COL ¶¶6.1-6.5. As will be discussed below in detail, this interpretation of the Construction Rule is inconsistent with both the plain language of the regulations and several prior rulings of this Board on this precise point. *See* JTI FOF/COL ¶¶44-45.

13. Staff and SEI assert Appendix A to the NRC NEPA regulations somehow require applicants and licensees to provide two types of water quality information to the Commission. They argue that the two sets of water quality information are to be used for different purposes : (1) complete baseline water quality information that describes the existing groundwater conditions at an ISR site, collected at least one year prior to the commencement of any major site construction (Criterion 7); and (2) water quality information collected prior to the commencement of operations that is used to set the "Commission approved background concentration" of constituents in the groundwater, and which is used only to detect lixiviant excursions and to establish standards for aquifer

restoration after uranium recovery is complete (Criterion 5B(5))." Staff FOF/COL ¶5.10; SEI FOF/COL ¶6.1-6.2.

14. Staff and SEI insert words and meaning into the Appendix A criterion that are not, in fact, in the regulation. Specifically, staff asserts that Criterion 7 of 10 C.F.R. Part 40, Appendix A, "requires" the licensee to establish two groundwater monitoring programs, the first of which consists of a preoperational monitoring program that is used to provide "complete baseline data" on the milling site and its environs. Staff FOF/COL ¶5.11. Staff even cites Criterion 7: "At least one full year prior to any major site construction, a preoperational monitoring program must be conducted to provide *complete* baseline data on a milling site and its environs." (emphasis added). *Id*. However, at no point does Criterion 7 state or assert anything about establishing "two groundwater monitoring programs," nor does Staff identify any language where it does any such thing. Rather, the text of the entirety of NRC's regulations speaks for themselves. Criterion 7, applicable to ISL sites, states unequivocally that "a preoperational monitoring program must be conducted to provide *complete* baseline data on a milling site and its environs." 10 C.F.R. § 40, App. A, Criterion 7 (emphasis added). Under Criterion 7, this baseline data is used to "measure or evaluate compliance with applicable standards and regulations; to evaluate performance of control systems and procedures; to evaluate environmental impacts of operation; and to detect potential long-term effects." *Id*. In other words, the baseline data required by Criterion 7 is also used for compliance purposes and detecting effects of the facility's operations. In fact, the text of Criterions 7 and 5 cross-reference each other, inferring that the data from one can be used interchangeably in the other. *Id*.

at § 40, App. A, Criterion 5B(1), *citing* Criterion 7(A). Therefore, the Staff's and SEI's bifurcation between the two criterion simply does not exist under the plain meaning of the regulatory text. As further evidence of this, the text of Criterion 5B(5) does not speak at all to the timing of when Commission Approved Background ("CAB") will be established, so there is no bar to establishing the CAB, or baseline, prior to the license.

15. Even assuming Staff and SEI's assertion that background concentration limits for detecting and recovering excursions and for assessing aquifer restoration, i.e. compliance purposes, can be potentially refined after the license and after the full wellfield package has been put in place and issued, this additional refinement has no bearing on the obligation under NEPA and Criterion 7 to do a complete and timely baseline assessment before the NEPA process is completed and the license issues. Nor does it present any regulatory language that suggests a conflict to the direct requirements of Criterion 7, much less a bifurcated baseline proceeding. In short, to comply with NEPA, the SEIS must contain a *complete* description of baseline water quality, and this *complete* data must be collected as part of the NEPA process and *prior* to the issuance of the license. The fact that additional wellfield data may be collected post-license, perhaps even for a different purpose (such as refining the restoration limits under Criterion 5 after additional information is collected), is immaterial to the issue at hand.[3]

[3] This is especially true given the conclusions of Joint Intervenors' experts that post-license collection of water quality data will not result in the collection of data establishing baseline, or pre-development, conditions because the data will be collected "as each area is brought into production." *See* SEI FOF/COL¶ 6.1 (*citing* SEI007 at 40).

16. Staff also ignores that a final EIS (or SEIS) be prepared "in accordance with" 10 C.F.R. § 51.71 (the DEIS requirements). 10 C.F.R. 51.71(d), in turn, requires, in pertinent part (emphasis added):

> *[t]he analysis for all draft environmental impact statements will, to the fullest extent practicable, quantify the various factors considered.* To the extent that there are important qualitative considerations or factors *that cannot be quantified*, these considerations or factors will be discussed in qualitative terms. Consideration will be given to compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, and local agencies having responsibility for environmental protection, including applicable zoning and land-use regulations and water pollution limitations or requirements issued or imposed under the Federal Water Pollution Control Act. The environmental impact of the proposed action will be considered in the analysis with respect to matters covered by environmental quality standards and requirements irrespective of whether a certification or license from the appropriate authority has been obtained.

Baseline water quality is an environmental factor that can – and should – be *quantified* given the numeric nature of the data. *See* Transc. at 435 (Testimony of Dr. Abitz: "The only way you . . . [can establish baseline] . . . is by quantitative analysis.").

17. In an inspired bit of linguistic reversal, Staff avers (at ¶5.15) that "[w]hile the regulations may not contain such specificity as to timing as the Intervenors may like, they do indicate that the process for developing the Commission approved background concentrations must be set through one or more conditions in an issued license." Staff again cites no language that provides it with the authority to defer the baseline assessment until after the NEPA process and ROD is complete (and thus not consider that data in the FSEIS) simply by making it a condition of the license. As noted above, Criterion 7 speaks for itself, and the arbitrary creation of the latitude to perform the quantitative baseline assessment long after the NEPA and licensing processes have concluded is a

fiction created by Staff which, while perhaps convenient for the industry, is fundamentally inconsistent with Staff's own regulations and NEPA. 10 C.F.R. § 40, App. A, Criterion 7; 10 C.F.R. § 51.71 (the DEIS requirements); § 51.71(d); *see also, e.g. Metcalf v. Daley*, 214 F.3d 1135 (9th Cir. 2000) (rejecting decision made before appropriate NEPA process completed).

18. As Joint Intervenors have demonstrated, the Construction Rule does not preclude the collection of groundwater data required to complete an SEIS in compliance with NEPA. Blending their (failed) Construction Rule argument with their assertion that there is a bifurcated (pre and post NEPA) process for establishing baseline water quality, Staff and SEI seek to have this Board reverse itself on the interpretation of the Construction Rule. However, as Staff acknowledges (at ¶5.17.), *twice* this Board has found that the collection of baseline water quality information does not constitute "construction" as defined in 10 C.F.R. § 40.4 because the regulation 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." LBP-12-3, "Memorandum and Order, Ruling on Standing and Contention Admissibility," 75 N.R.C. at 194; *see also id.* at 193-95 (interpreting the regulations to permit the data collection necessary to provide a "description of the existing water quality baseline."); *see also* Mem. Order of May 23, 2014 at 6 (rejecting SEI's argument that applicable regulations do not "permit the gathering of detailed wellfield and monitor well quality data prior to issuance of an (ISR

facility) license," and explaining that "SEI's (and the staff's) arguments regarding the legal merits of the contention do not suggest a different result" than they did as to the DSEIS).

19. Staff and SEI also fail to mention that this Board's reading of the regulations is also consistent with the interpretation of the Board in the Dewey-Burdock licensing proceeding. That Board explained, the "preconstruction monitoring" expressly permitted under 10 C.F.R. § 40.4, "*includes adequate assessments of baseline water quality*." *Dewey-Burdock*, LBP-10-16, 72 N.R.C. 361, 424 (2010) (emphasis added); *see also Dewey-Burdock*, LBP-13-09 (ruling on DSEIS contentions) at 20 (admitting contention against DSEIS on grounds it "fails to include a proper analysis of the required baselines with respect to groundwater quality"); *accord Dewey-Burdock*, LBP-14-5 (2014) (ruling on FSEIS contentions), App. A ("The FSEIS fails to include necessary information for adequate determination of baseline ground water quality").

20. Staff provides a novel new argument that suggests a distinction in the regulations between baseline water quality information necessary to characterize the ISR site and baseline water quality information necessary to establish excursion monitoring and restoration values. They assert this later construction is barred, and that this should lead this Board to reverse a matter it has already ruled on twice. Staff FOF/COL ¶¶5.17-5.19. Staff restates yet again the argument of its fictional bifurcated baseline analysis proceeding, blithely ignoring the express language of Criterion 7 and now tries for the fourth time (the challenge to the application, the challenge to the DSEIS Contentions, the

challenge to the FSEIS and now at the evidentiary hearing phase) to have this Board reverse itself on this matter.

21. This Board will not revisit a legal issue long since put to rest in this proceeding and in the parallel Dewey Burdock proceeding. *See, e.g., Ciralsky v. Central Intelligence Agency,* 355 F.3d 661, 671 (D.C. Cir. 2004) (discussing the high burden party must meet before being permitted to "relitigate old matters"). In any event, there are not two baseline assessments as Staff proposes – one, admittedly (at ¶6.19) qualitative and limited and the second, post-NEPA and far more substantial and quantitative – because support for such a bifurcated baseline assessment process does not exist in the regulations.

22. Further, SEI relies on NUREG-1569 as establishing what data is required to be collected. SEI FOF/COL ¶¶8.8-8.14, 10.1, 10.9-10.16, 10.18-10.19. This reliance is misplaced because a guidance document cannot contravene NEPA and its implementing regulations, and in any event does not have the force of regulations and is not directly binding on this Board. *See* Mem. and Order of August 12, 2014, at 21-22, note 6 ("It is generally recognized that a staff guidance document such as NUREG-1569 is not considered binding on a licensing board."). The document does not speak directly to the requirements of NEPA and cannot substitute for meeting those requirements. Further, SEI's attempted reliance on NUREG-1569 is wholly misplaced because, in this case, the SEIS departs from its guidance, specifically the requirements to sufficiently characterize the pre-license baseline water quality. *See, e.g.* JTI FOF/COL ¶¶38-41.

23. In short, there is no support in the regulations for Staff or SEI's fiction of a qualitative, general characterization of baseline information followed in post-hoc fashion – long after the NEPA process and decision have been concluded – by a meaningful, quantitative determination of the constituent concentrations that accurately characterize pre-mining baseline water quality in the exempt and potentially affected neighboring aquifers.

24. Staff and SEI also attempt to rely on *In Re Hydro Resources, Inc*. (HRI) for the proposition that it is appropriate to simply include license conditions that require SEI to submit additional information on water quality after it has received a license. Staff FOF/COL ¶5.20; SEI FOF/COL ¶¶6.5, 8.14. They allege that in *HRI*, the Commission explained that the site-specific data needed to confirm baseline water quality values cannot be collected until after an *in situ* leach wellfield has been installed. *Id.* That holding is irrelevant to the present proceeding in two respects. First, Contention 1 does not concern whether the SEIS includes all the data "to confirm proper baseline water quality values" to be used for the purposes of excursion detection and aquifer restoration, but, to the contrary, whether Staff and SEI may hide behind the Construction Rule to avoid collection of *any* additional data to characterize baseline water quality for the purpose of NEPA disclosure and analysis. Indeed, the Construction Rule was not even at issue in *HRI*. Rather, intervenor's argument there centered on whether collecting the data at issue post-license would violate petitioner's rights to a *hearing* on matters material to the licensing decision. CLI-06-01 at 3 (explaining that "intervenors argue that these license conditions violate their statutory rights, under the Atomic Energy Act, to a

hearing on issues material to licensing"). Second, the Commission's ruling did not address the obligations under NEPA to collect, disclose, and consider data that is both vital to the decision-making process and capable of collection. *See, e.g.* 40 C.F.R. § 1502.22(a) (directing that 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"). Thus, while the "site-specific data to *confirm* proper baseline quality values" may be collected post-license, CLI-06-01 at 7, that has no bearing on whether legally *sufficient* baseline data must be collected in the NEPA process and before the license issues.

III. STAFF'S & SEI'S FINDINGS OF FACT ARE NOT SUPPORTED BY THE EVIDENTIARY RECORD IN THIS PROCEEDING.

A. Contention 1

25. Rather than defending the scientific integrity of the baseline data discussed in the SEIS, Staff and SEI downplay NEPA's requirements and assert that they do not have to use rigorous and statistically valid protocols for the collection of baseline water quality for the Staff's NEPA review of Strata's ISR license application. Specifically, Staff and SEI assert that the well-established scientific protocols discussed by Joint Intervenors, including EPA's guidance for establishing baseline water quality as required for the purposes of RCRA and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), are not relevant here. Staff FOF/COL ¶¶6-4-6.9; SEI FOF/COL ¶¶10.25-10.28. Staff and SEI are simply wrong, for, as Joint Intervenors have detailed, groundwater quality baseline data can – and must – be more accurately quantified than the data presented in the FSEIS. JTI FOF/COL ¶¶93-97. Contrary to the Staff and SEI's

suggestion, EPA's Unified Guidance is persuasive on this topic because of its recommendations on how to properly establish baseline water quality in a scientifically defensible quantitative manner that conforms precisely with the requirements of 10 C.F.R. §51.71 for quantitative analysis *whenever* possible. The Guidance explains basic fundamental scientific and statistical principles that apply regardless of site type. *See* Transc. at 428 (Testimony of Dr. Abitz: "It's the same fundamental principles, scientific and statistically [that] apply."); Transc. at 431 (Testimony of Dr. Abitz: "A baseline or background is just that. It's the same regardless of what type of regulatory environment you're in."). And this is not just the urging of Joint Intervenors' expert witness. The record also demonstrates that Department of Energy's Characterization of Background Water Quality for Streams and Groundwater presents instructive statistical procedures for quantitatively determining baseline water quality. JTI014 at 923-995 (Appendix F on Statistical Procedures, Equations, and Results).

26. At ¶6.18, Staff finally arrives at its defense of its technical analysis, but in so doing has listed a series of propositions where there is not just little support in the record, but factual evidence that each of these propositions is either wrong or beside the point. Each of those propositions will be discussed in turn below.

1. Screen Lengths in Wells Were Not Adequate

27. Contrary to SEI's and Staff's arguments (at ¶¶10.47-10.48 and ¶6.8 respectively), the site characterization wells were inadequate because the screen lengths for the existing monitor wells were inappropriate. JTI001-R at 21-22. The wells were screened only through the part of the ore zone (OZ) water horizon that is in contact with the ore zone,

rather than the entire column of water in the OZ sand interval. Transc. at 354 (SEI Witness, Mr. Knode: "It is correct, as we discussed earlier today, that we do only screen the ore zone"). The screen lengths for the existing six monitor wells in the OZ zone are approximately ¼ to ½ the thickness of the OZ sand and centered on the ore zone. JTI001-R at 21-22 (citing Technical Report and Addenda). Proper procedures require screening through the entire column. JTI001-R at 22 ("fully screened intervals are more accurate in their representation of the water quality . . ."); *see also* Transc. at 416-417; JTI FOF/COL ¶¶61-62 (discussing NUREG-1569's recognition of this bias, stating that fully screened intervals are more accurate in their representation of the water quality that a water monitor will encounter) (citing SEI007 at 140). Moreover, SEI's plans for post-licensing (and post-NEPA) wells are simply irrelevant to the adequacy of the well data relied on in the FSEIS. SEI FOF/COL ¶¶10.49-10.54 (discussing future wells).

2. Drilling-Caused Oxygen Induction Biased Data Results

28. In direct contrast to Staff and SEI's assertions (at ¶¶10.41-10.43,10.45-10.46), the drilling process does induce oxygen into the system such that it biases the entire process, as Joint Intervenors have demonstrated. JTI FOF/COL ¶¶67-75 (citing JTI001-R at 24-26) (demonstrating the trends for uranium and radium-226 show that the ore zone is disturbed and oxidized by well installation and development activities.)

29. Neither SEI nor NRC Staff have considered an alternative method that would use air-rotary drilling with recirculated nitrogen gas instead of air and a foam surfactant that contains organic constituents to eliminate oxygen. *See, e.g.*, Transc. at 366 (witness for SEI stating that he was not aware of any ISL site that had used nitrogen in drilling).

However, such methods are entirely feasible, would provide significantly more accurate data. *See* JTI011 at 57; JTI001-R at 18 (describing these methods).

3. Upgradient Well Data Is Needed

30. Staff also fails in its attempt to explain why it did not comply with its own guidance, NRC Regulatory Guidance 4.14, which states that at least one well must be hydrologically upgradient to serve as a source for background samples. SEI008 at 3. Staff claims this requirement does not apply because the regulations/guidance were originally designed for conventional uranium mills as opposed to ISL sites. Staff FOF/COL ¶6.9; *see also* SEI FOF/COL ¶ 10.28 (arguing that "upgradient/downgradient monitoring approach is not directly applicable to an ISR facility"). This is a distinction without a difference. The record shows staff did not consider data from an upgradient well. No upgradient well was identified in the FSEIS, and according to NRC Staff no such well is necessary. NRC001 at 14-16 ("Upgradient water quality data are not necessary for Ross Project site characterization purposes . . . ."). However, under EPA Guidance, and under NRC's own guidance documents, upgradient wells are necessary to establish baseline conditions and there is no exception identified for ISL mining. JTI001-R at 7-8. As has been previously noted, the establishment of baseline water quality values is based on well-established scientific protocols that apply regardless of facility type. Moreover, Staff contends that such a well is not necessary because it would not establish water quality in the production zone. Staff FOF/COL ¶ 6.10; *see also* SEI FOF/COL ¶ 10.29 (arguing that "unbiased grid sampling" is not necessary "since the goal is to obtain representative samples from the uranium ore bodies."). This argument cannot be

reconciled with NRC's regulations, which require establishment of baseline water *quality in the project area*, not just in the production zone. *See* 10 C.F.R. Pt. 40, App. A, Crit. 7 (requiring "complete baseline data on a milling site and its environs). This is particularly important to assess impacts to areas outside of the ore zone. Staff and SEI's argument that it only needs to evaluate the baseline within the ore zone also contradicts their argument in the other Contentions that they are only concerned with protecting the environment beyond the ore zone. *See, e.g.* JTI FOF/COL ¶¶ 120-127.

4. Deficiencies in Nubeth Data

31. With respect to the Nubeth site, Staff and SEI argue that the Nubeth water quality data was appropriately used to establish baseline at the Ross site in the FSEIS. Staff FOF/COL ¶6.12; SEI FOF/COL ¶10.36. To this end, Staff asserts there is no consistent relationship between levels of uranium and radium-226 in the groundwater, and moreover, the high levels of radium in in the Ross Project groundwater existed prior to any ISL development taking place on the site. *Id.* Staff is wrong, and the record shows the 1976 project, a single-well, push-pull study (*i.e.*, the injection and extraction of lixiviant from a single well) (*see* SEI009A at 3-38 (at .pdf p. 182)), occurred nearly two years ***before*** the first baseline samples were collected in April 1978. NRC017. The use of the 1978 well data is not accurate in establishing baseline values because the impacts of the Nubeth project had already occurred. This impact is evident by the data presented in Table 3.7 of the FSEIS. SEI009A at 3-41 (at .pdf p. 185). Nubeth wells 3x, 4x and 19x captured water samples from the aquifer where the lixiviant injection oxidized the ore zone, as they all had high radium-226 values in excess of 10 mg/L. Wells 5x, 6x, 11x

and 12x had radium-226 values less than 3 pCi/L, but uranium values as high as wells in the oxidized ore zone. *See* JTI FOF/COL ¶ 90. Staff's assertion that there is no consistent relationship between levels of uranium and radium-226 in the groundwater is simply unsupported in the record. Because the ore was injected with lixiviant *before* baseline water-quality samples were collected, the Nubeth wells used to collect water-quality samples were contaminated by the injection of the lixiviant prior to sample collection. In other words, pre-project baseline does not exist for the Nubeth pilot-scale study and the post-project well data cannot accurately be described as "baseline" data for the Ross Project area. JTI001-R at 33-34.[4]

32. It is this Board's finding that Staff could account for the single push pull well and the impact of Nubeth if it performed the complete baseline assessment across the exempted aquifer, as Joint Intervenors urge. See JTI FOF/COL ¶¶93-97.

33. Despite these failings, Staff found SEI's submissions adequate under Criterion 7 and with the Standard review plan. Staff FOF/COL ¶6.14. There is no support for this finding in the record because the data contained in the SEIS, which is based on SEI's application, is not sufficient to establish *complete* baseline water quality values, as required by Criterion 7 and NEPA. See JTI FOF/COL 31-103.

[4] Moreover, groundwater quality data from 1978 is not data from the "environment that existed just prior to Strata submitting its license application" which, as NRC Staff witnesses identified, is the most relevant to establishing baseline conditions at the Ross Project site. Transc. at 452.

5. Requirements For Adequate Data Collection And Impacts Disclosure

34. Finally, in a last attempt to justify its limited analysis of baseline water quality in the FSEIS – and without support or citation and flatly contradicting its own regulations requiring a complete, quantitative assessment (*see* Criterion 7 and 10 C.F.R. §51.71(d)) – Staff asserts that "[t]o meet the requirements of 10 C.F.R. Part 51, the FSEIS must succinctly describe the environment to be affected by the proposed action, with data and analyses in the statement to be described at a level of detail commensurate with the importance of the impact – less important material is to be summarized, consolidated, or simply referenced." Staff FOF/COL ¶6.19. Staff relies on this provision in urging the Board to find there are "no grounds to conclude that a quantitative analysis of groundwater data at the Ross Project site is mandated by NEPA." *Id.* As discussed above, this statement is directly contradicts the plain language of 10 C.F.R. Part 51, which requires analysis in the Staff's EIS to be quantitative in nature (unless quantitative data cannot be collected).

35. For their part, SEI does not contend that a quantitative analysis is unnecessary, but instead claim that one was done for the Ross Site. SEI FOF/COL ¶10.22 ("Strata's license application provides a representative, quantitative description of the baseline groundwater quality within and adjacent to the license boundary . . ."). However, SEI acknowledges that the data does not permit a "detailed statistical evaluation," arguing that such scientific rigor is not necessary under NEPA. *Id.* at ¶10.24. As Joint Intervenors have explained, this conclusion is fundamentally inconsistent with NEPA requirements. and amounts to an argument that a federal agency may supply to the public and other

government agencies, via the Draft and Final EIS's, environmental conclusions based on data that it knows to be either incomplete, inaccurate, non-representative, or otherwise inferior to the data that it reasonably could have collected, and moreover claims it *will* collect for its own purposes after the Record of Decision has been taken. See JTI FOF/COL ¶¶ 25-30 (detailing NEPA requirements).

36. In addition to relying on its erroneous view of the applicable data collection requirements under NEPA, Staff also seeks to defend its conclusion that the environmental impacts will be SMALL, despite the failure to collect adequate baseline data, on the fact that the aquifer is not presently a source for drinking water. Staff FOF/COL ¶¶ 6.20-6.25. In Staff's view, merely because the aquifer is not currently a drinking water source, there is no impact level that would be considered other than small. *See* Transc. at 548 ("We have not found that an ACL, which would have no -- pose no current or potential hazard to human health would also destabilize important attributes of the resource considered."). As Joint Intervenors have demonstrated (at JTI FOF/COL ¶28, however, environmental impacts are not limited to those to which humans will be exposed, and the flaw in Staff's logic demonstrates that its impact conclusion cannot be sustained. *See* 40 C.F.R. § 1508.8(b) (requiring full disclosure of "effects on air and water and other natural systems, including ecosystems").

37. NEPA and NRC's own regulations clearly require a quantitative and complete assessment of baseline water quality. The Staff has not adequately characterized baseline groundwater quality in a statistically meaningful and defensible quantitative manner and disclosed the results of this characterization effort in the FSEIS. 10 C.F.R. § 51.71(d); Id.

§ 1502.15; *see also Friends of Back Bay v. U.S. Army Corps of Engineers*, 681 F.3d 581, 588 (4th Cir. 2012) (holding that "A material misapprehension of the baseline conditions existing in advance of an agency action can lay the groundwork for an arbitrary and capricious decision.").

B. Contention 2

38. While Staff asserts (oddly, in its proposed findings for contention 1) that the data and analyses in the FSEIS have been described at a level of detail commensurate with the importance of the impact, Staff FOF/COL ¶6.19, this assertion ignores the astonishing degradation of the mined aquifer that has been demonstrated in this proceeding via NRC's own data (*see* JTI005A-R2 and JTI005B-R2), and the complete failure to require SEI to restore even to the biased baseline, much less a technically sound and defensible baseline. Thus, while the FSEIS claims the impacts will be SMALL, the LARGE and irreversible damage to this aquifer has not been disclosed and discussed, and mitigation alternatives considered, as NEPA requires.

39. Staff's conclusion (at ¶6.21) that the long-term impacts of the Ross Project would be SMALL because of its licensing conditions and the EPA aquifer exemption ignores NEPA and the impacts it is supposed to present for the decisionmaker. The record of this proceeding presents uncontroverted factual comparisons of baseline and post-restoration uranium concentrations in the affected groundwater that demonstrate substantial degradation of that groundwater, clearly noticeable and sufficient to destabilize important attributes of the resource considered. No ISL mine has ever returned groundwater

concentrations to primary or secondary standards. JTI003-R at 68; *see also*, JTI Findings at ¶163 and Transc. at 552-553.

40. Staff suggests (at ¶6.23) that it would have found that groundwater quality impacts are large if they destabilize the quality of the groundwater only in such a way that its *current* use becomes compromised, and to show that the impacts of the Ross Project would be large Intervenors must demonstrate that the important attributes of the groundwater would be destabilized after operation and restoration of the Ross Project such that it could not be restored to a state that would be protective of public health and the environment.

41. Staff's proposition clearly fails to consider future uses of scarce groundwater in the arid west, relying instead on EPA's exemption as an allowance for the exempted aquifer to act as a toxic, hazardous disposal area. Such a use of the aquifer was not disclosed in the DSEIS, and only in the FSEIS did the parameters of Staff's minimalist concern with the environmental impacts of ISL recovery become clear. *See* JTI FOF/COL ¶125 (In the DSEIS, Staff stated that aquifer restoration will "return the ground-water quality in the production zone (i.e. the exempted ore zone) to ground-water protection standards specified at 10 CFR Part 40, Appendix A." NRC006B at 4-39 (emphasis added); *cf*. JTI FOF/COL ¶126 ("The FSEIS, by contrast, states: 'the purpose of aquifer restoration is to restore the ground-water quality in the wellfield to the ground-water-protection standards specified at 10 CFR Part 40, Appendix A, Criterion 5B(5) (see SEIS Section 2.1.1.2), so as to ensure no hazard to human health or the environment (NRC, 2014b). Water quality

is measured at the *point of compliance that coincides with the established boundary of the exempted aquifer*.' SEI009A at 2-34 (at .pdf p. 118) (emphasis added))".[5]

42. Staff's late attempt to move the goalposts of aquifer restoration and allow the exempted aquifer to be substantially degraded without any meaningful disclosure or analysis as to the long term impacts finds no support in the record of this proceeding or in law.[6]

43. First, excursions of mining fluids impact water in aquifers outside of the EPA exempted aquifer, either vertically or horizontally adjacent aquifers. The record of this proceeding includes dozens of examples of vertical excursions where there were observed concentrations for uranium and selenium in exceedance of drinking water standards that occurred in shallow aquifers, not the mined ore zone subject to an aquifer exemption. *See, e.g*., JTI036, Page: 59-85 (discussed in JTI FOF/COL ¶¶ 225).

44. Also, the data from the Smith Highland ISL site shows extensive elevated groundwater concentrations of uranium and selenium in the shallow (~<200 ft depth),

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[5] *See also*, where Staff states: "[t]he purpose of aquifer restoration is to restore the respective aquifer to its baseline conditions, as defined by post-licensing, pre-operational constituent concentrations (see Section 2.1.1.2), so as to ensure public health and safety." NRC006B at 2-32.

[6] We note in passing the "boundary of the exempted aquifer" is belatedly disclosed in the FSEIS as extending 500 feet *beyond* "the outer edges of the wellfields indicated in SEIS Figure 2.4 (EPA, 2013)," which wellfields increased in area by 78% between the draft and final SEIS documents. Moreover, the FSEIS disclosed for the first time that this expanded wellfield area could itself grow substantially, such that "the maximum area of the wellfields would not exceed the total area of the exempted aquifer." SEI009A at 2-17. Thus the area potentially subject to the NEPA standard of "reasonably foreseeable" environmental degradation is now *much larger* than the initial "production zone" disclosed for public and other government agency comment in the DSEIS, and effectively encompasses the entire region covered by the aquifer exemption.

non-uranium ore bearing aquifers. These elevated concentrations of uranium and selenium were reportedly the result of dozens of failed ISL injection well casings in mine units C, E, and F. JTI036 at .pdf p. 8.42.

45. Next, Staff's functional use of the exempted area as a disposal site must be disclosed and the long term impacts analyzed. NEPA requires an agency to analyze the environmental impact of a project on, *inter alia*, "air and water and other natural systems, including ecosystems," 40 C.F.R. § 1508.8(b), including by disclosing "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. The impacts on these resources must be disclosed irrespective of immediate human consumption of the affected groundwater. *See* 40 C.F.R. § 1508.14 (defining the "environment" covered by NEPA to include "the natural and physical environment . . . .").

46. The fact that Wyoming Department of Environmental Quality ("WDEQ"), with EPA's concurrence, has determined that the ore zone aquifer does not currently serve a drinking water source is only part of what must be assessed under NEPA. Indeed, all parties note the Ross Project Site has an aquifer exemption granted by the EPA. SEI034. However, in determining whether to grant the exemption, EPA only considered whether the aquifer is *currently used* for drinking water purposes – not whether the water is of sufficient quality to be used for future drinking water purposes. *Id.*; *see also* SEI FOF/COL ¶10.38 ("It is not necessary to conclude that the groundwater quality in the production zone exceeds EPA MCLs in order to permit or license the Ross ISR Project . . . EPA's aquifer exemption approval was granted on the basis that the groundwater within

the exempted aquifer does not currently serve as a source of drinking water and contains minerals (uranium) in a quantity that is expected to be commercially producible."). The long term sacrifice of that aquifer and the likely harms to non-exempt aquifers must be disclosed in this proceeding.

47. In beginning its defense of its analysis of restoration impacts in the FSEIS, Staff acknowledges (at ¶6.29) that this Board found that the DSEIS failed to address the crux of the contention, *i.e.*, since an ACL may realistically be necessary, "within a reasonable range," what is the potential ACL likely to look like and what might be the associated impacts. Notably, Staff omits what the ACL was *looking at* in terms of restoration – at DSEIS it was the mined aquifer, and in the FSEIS it is outside the point of compliance.

48. Staff (at ¶6.32) defends the new bounding analysis it did present in the FSEIS, a minimal and inaccurate examination of three facilities – Crow Butte Wellfield 1, Smith Ranch-Highland A Wellfield, and Irigaray Mine Units 1. Staff concluded if an ACL is requested by Strata for the Ross Project, it is likely to range between 1.7 mg/L and 3.5 mg/L, or 4 to 71 times the post-licensing, pre-operational background values for uranium that ranged from 0.05 to 0.52 mg/L. *Id.*

49. Staff's conclusion is wrong and not supported by the record of this proceeding. Staff's discussion of each of these sites is inadequate and fails to present an accurate or meaningful understanding of what is certain to occur as a result of the Ross Project: irretrievable and irreversible environmental degradation of groundwater quality where the environmental impacts are clearly noticeable and are sufficient to destabilize important

attributes of the resource considered, which the FSEIS does not acknowledge or discuss. JTI003-R and JTI005(A)-R2 and JTI005(B)-R2.

50. As an initial matter, Staff misstate Joint Intervenors' concerns with the alleged bounding analysis in asserting Intervenors, "claim that the FSEIS's discussion of the Irigaray facility is deficient because the NRC approved of restoration at that facility based upon a methodology that used a composite average baseline for all wellfields, rather than an initial average baseline for each individual wellfield. These concerns, however, are essentially directed at the Commission's previous decisions to approve restoration of these facilities, rather than to the Staff's discussion of these decisions in the FSEIS." Staff FOF/COL ¶6.34. That is precisely wrong. Whatever the Commission did in approving or not approving the "restoration" is beside the point and irrelevant to Joint Intervenors' concerns. Rather, Joint Intervenors' concerns are clearly aimed at the failure of Staff in *the Ross Project FSEIS* to present the full extent of the environmental harm and the actual, documented impacts to the aquifer. *See* JTI003-R and JTI005(A)-R2 and JTI005(B)-R2. There, Intervenors explain that Staff's discussion of each of these sites is inadequate and fails to present an accurate or meaningful understanding of what is certain to occur as a result of the Ross Project. Such a demonstration precisely tracks with the NEPA obligations Staff has ignored.

51. Staff further asserts Joint Intervenors have not challenged Staff's claim that it has analyzed the best sources of restoration information. Staff FOF/COL ¶6.35. This, again, is beside the point. Joint Intervenors have not challenged the fact that these are places where "restoration," such as it is, has been approved. In contrast, Joint Intervenors have

demonstrated the failure of the analysis in the FSEIS as to the accuracy of Staff's presentation of those sites. *See* JTI FOF/CO ¶¶134-164 (providing a thorough discussion of the inadequacy of the analysis and the record that supports those findings).

52. Joint Intervenors have presented the NRC's own data and the likelihood of post restoration numbers that far more accurately reflect the large and irreversible harm to the environment than disclosed in the FSEIS. Groundwater data from other representative ISL sites, such as Christensen Ranch Mine Units 2 – 6 and Smith-Highland Ranch Mine Units A and B, is relevant because those operators used restoration methods and circulation volumes similar to those proposed for the Ross project. SEI009A at 2-35 (at .pdf p. 119) ("The aquifer-restoration activities proposed for the Ross Project are the same as those methods described in GEIS Section 2.5: 1) ground-water transfer, 2) ground-water sweep, 3) RO treatment with permeate injection, 4) ground-water recirculation, and 5) stabilization monitoring."). These sites show that after those restoration methods were employed, uranium concentrations in the groundwater within the ore zone have still increased substantially, and in some cases, by several orders of magnitudes or more. JTI003-R at 22-48; JTI052-R at 3-7; *see also* JTI FOF/COL ¶¶ 165-182 (detailing actual results from the NRC's own database).

53. Staff also asserts (at ¶6.37) it used the best information available, which is not accurate. While the sites Staff relied upon where restoration was concluded certainly are useful, Staff failed to accurately present what transpired at those sites. And further, Joint Intervenors used NRC's own data at sites either undergoing or in "post-restoration"

(where this Board has no idea whether additional restoration will take place) and proved a starkly different picture of environmental harm.

54. Staff (at ¶6.39) suggests Intervenors fail to explain how the impacts from the use of an ACL will be both "clearly noticeable" and "sufficient to destabilize important attributes" of the groundwater, in light of the fact that ore zone aquifer is exempted as a USDW.

55. Second, as the record in this proceeding shows, "all roads lead to ACLs" (*see* Transc. at 552) and while SEI attempts to claim that the criterion to set an ACL necessarily prevents impacts (SEI FOF/COL ¶¶10.73-10.77), the record demonstrates that contamination of the mined area is drastic – a clearly noticeable and of significant alteration of the resource and indisputably "sufficient to alter noticeably" important attributes of the resource considered. Joint Intervenors have documented that in every instance key chemical constituents (i.e. "important attributes") of the affected groundwater are altered to many times their baseline values. See, e.g., JTI052 at 6, 7. To find, as Staff and SEI would have it, that the environmental impacts is always small temporary, regardless of the contamination level of the ACL inevitably adopted has no merit under NEPA and functionally consigns the first ranked choices of Criterion 5B (restoration to background, second choice, restoration to EPA's MCL standard) out of the law.

56. Next, Staff suggests (at ¶¶ 6.38-6.43) Joint Intervenors' argument that restoration to values other than pre-operational baseline values amounts to "restoration failure" fails to acknowledge the Commission's approval of alternate restoration standards. Joint

Intervenors are well aware of and have long acknowledged the ACL process, but merely noted ISL sites have failed to restore to baseline in every instance – which is simply a statement of fact. Rather, Joint Intervenors have asserted Staff failed to take a hard look at the environmental impacts of the near certain *failure of restoration* that will occur at the Ross site, failed to present an accurate representation of the extent of severe contamination of both exempted and non-exempted aquifers at other sites that serve as examples of what is reasonably foreseeable at the Ross site.

57. Finally, Staff's conclusion in the FSEIS regarding potential impacts to groundwater from the Ross Project assumes that a Commission-approved ACL *of any amount* would have only a small impact on groundwater at the site. Staff FOF/COL ¶¶6.42, 6.43. In other words, for the purposes of determining the potential effects of the Ross Project, the Staff considered a scenario wherein Strata would be unable to restore groundwater to primary or secondary limits, and concluded that such impacts would nevertheless be SMALL. Therefore, because the FSEIS accounts for this possibility and in addition describes, based upon historical experience, what the range of hazardous constituent values for a Ross Project ACL may look like, Staff claims the FSEIS provides all of the information required under NEPA. If the aquifer could not be returned to that condition, the NRC would require that the aquifer meet EPA MCLs as provided in 10 C.F.R. Part 40, Appendix A, or ACLs as approved by the NRC.197 The FSEIS concludes that, for these reasons, the potential impacts to water quality of the exempted aquifer as a result of ISR operations is expected to be SMALL and temporary.).

58. Finally, SEI's claim that analysis of impacts resulting from an ACL would be "a purely speculative NEPA evaluation," (SEI FOF/COL ¶7.9), fails on several grounds. First, such an impacts analysis is not speculative, as this Board ordered in admitting Contention 2 and carrying it forward through these proceedings to the hearing. LBP-12-3, at 34. This Board ordered that although we do not yet know the precise ACL that will be approved at the Ross site, an impacts analysis can stem from the past experience at similar facilities through a "bounding analysis." *Id*. Information put forward by Joint Intervenors demonstrates that such a "bounding analysis" is clearly possible in the context of the Ross site. As this Board has noted, since "all roads lead to ACLs," the use of ACLs is clearly foreseeable, and in order to meaningfully assess the impacts to the mined and adjacent aquifer post-restoration, the EIS must consider the likely consequences of the use of ACLs. For all of these reasons, SEI's claim that impacts analysis of an ACL is too speculative for NEPA analysis is rejected.

C. Contention 3

59. Contention 3 is centered on the SEIS's failure to adequately analyze the potential for and impacts associated with fluid migration. Specifically, the contention centers around the risks and impacts associated with unplugged exploratory boreholes, problems identified with the applicant's pump tests, and control of excursions during operations.

1. Failure to Consider Risks and Impacts from Unplugged Exploration Wells

60. Both SEI and Staff allege that no impacts will result from unplugged exploration drill holes. In making this assertion, both SEI and Staff depend not on an environmental analysis of the consequences of one or multiple unplugged boreholes within the impacted

area, but on conditions imposed in SEI's license, particularly License Condition 10.12. SEI FOF/COL ¶10.94; Staff FOF/COL ¶6.47. However, as discussed by Joint Intervenors, License Condition 10.12 does not actually *require* the licensee to detect and plug all preexisting boreholes in the impacted area, and thus does not sufficiently protect adjacent aquifers from the risk of fluid migration. JTI FOF/COL ¶¶212-217. The SEIS does not discuss the adequacy or enforceability of the license condition, which results in a serious underestimation of impacts related to fluid migration. *Id*. at ¶216.

61. SEI's testimony at the hearing about the number of exploration wells that the company has located – which significantly differed from the information contained in the SEIS – nonetheless still raises questions about the adequacy of the license condition. First, SEI's identified a number of exploration wells that is approximately 200 less than the SEIS. *Compare* SEI FOF/COL ¶10.95 (stating that there are 1,483 wells) *with* SEI009A at 2-48 (stating there are 1,682 wells). There is no explanation of why the additional 200 wells are now immaterial to NRC Staff's impacts analysis. Second, SEI admits that 8% of the 1,483 wells it is attempting to locate have not yet been found and there is no explanation of what is entailed by the "more rigorous search" that will be done before submitting a wellfield package. SEI FOF/COL ¶10.96; *see also* Staff FOF/COL ¶6.47.

62. While SEI claims that "NRC Staff will review Strata's attempt to locate and plug all historical boreholes," they note that NRC will merely "require a good faith effort." SEI FOF/COL ¶10.104. As Joint Intervenors have noted, this "good faith effort" is no substitute for impacts analysis in the NEPA document because NRC Staff testified that

they will rely on company representations about plugging efforts and will not enforce the license condition. JTI FOF/COL ¶214(*citing* Transc. at 764-65). While SEI claims the wells will be "readily identifiable and easily locatable," SEI FOF/COL ¶ 10.97, this ignores the issue of uncased holes that tend to collapse and fill in. JTI001R at 46, ll. 10-19; *see also* Transc. At 753 (Dr. Larson explaining that prior excursions are due to "failed casings," "thinning geology," and "historical well holes"). Moreover the evidentiary record reflects that SEI's efforts are not likely to be good enough, as evidenced from past ISL projects with similar license conditions. *See* JTI FOF/COL ¶ 215.

63. In response to Joint Intervenors' concerns, Staff and SEI contend that the Board must presume that the licensee will comply with its license conditions. Staff FOF/COL ¶6.52; SEI FOF/COL ¶5.12. Even if this were true, the mere presumption of license compliance does not ensure that detection and proper plugging of all legacy boreholes will be accomplished. NRC cannot abdicate its agency responsibilities, under NEPA, to analyze the potential impacts associated with its licensing actions, including a reasonably foreseeable failure to identify and plug all the boreholes that could represent pathways for fluid migration. Here, where the license condition itself contains vague and conclusory terms, even assuming the license conditions will be met is not good enough. There is no analysis of what it means to undertake a "good faith effort" and the terms of the condition are so vague they are likely to be unenforceable and therefore Staff's reliance on the license condition do not meet NEPA's "hard look" requirements. *See, e.g., Southfork Band Council v. Interior*, 588 F.3d 718, 727 (9th Cir. 2009) (agency must insure the applicant's "proposed mitigation measures" will be effective).

64. NRC Staff similarly cannot avoid NEPA's "hard look" requirement by relying on the license condition requiring SEI to provide "further documentation of historical borehole identification and abandonment" in future reporting. Staff FOF/COL ¶ 6.54. Once again, the promised consideration, *long after* the NEPA process is complete, of this important factor in assessing the environmental impacts of the project cannot substitute for the requirement to fully analyze these matters *in the NEPA process*.

65. NRC Staff also attempt to rely on License Conditions 11.3, 11.4, and 11.5 related to excursions to assert that risks of unplugged boreholes will be "SMALL" as the SEIS concludes. Staff FOF/COL ¶¶6.48-6.49. In essence, Staff admits that there will still be excursions at the site, but that impacts will be "SMALL" because they claim the excursions can be identified and corrected before they cause impacts. *Id*.; *see also* SEI FOF/COL ¶10.106. However, as Joint Intervenors demonstrate, vertical excursions, such as those that would occur from unplugged boreholes, are particularly difficult to control, as the experience of other ISL facilities shows. JTI FOF/COL ¶¶198-203, 210; *citing* SEI009A at 4-37 ("Vertical excursions tend to be more difficult to recover than horizontal excursions, and in a few cases, remained on excursion status for as long as eight years."); *see also* NRC020 at 29 (Staub *et al.* 1986); *see also* JTI003-R (Larson Direct Test.) at 54, ¶A.72. Therefore, Staff's conclusion that impacts stemming from fluid migration caused by unplugged boreholes will be "SMALL" is without basis. [7]

[7] As a further indication that excursions are likely, and must be fully evaluated in the FSEIS, we note that an article last week revealed two massive uranium spills at the Nichols Ranch site, where the Board conducted a site visit. *See* Mead Gruver, Associated Press, "*$5,000 Fine For Uranium Spills At New Wyoming mine*," reprinted in Reading Eagle, Nov. 14, 2014 (noting a 20,000 gallon spill on July 17, 2014 and a separate 12,000 gallon spill on September 8, 2014); *see also* 10 C.F.R. § 2.337(f) (reflecting Board's

2. Failure to Conduct Adequate Pumping Tests to Assess Confinement of the Aquifer

66. Both SEI and Staff assert that the pumping tests conducted by Strata were sufficient "to determine the aquifer hydraulic parameters and to demonstrate confinement . . ." SEI FOF/COL ¶¶10.108, 10.112-10.118; Staff FOF/COL ¶¶ 6.55-6.62. Joint Intervenors have demonstrated that the FSEIS does not establish the aquifer is confined. JTI FOF/COL 218-222.

67. Staff asserts (at ¶ 6.54) that presence of unplugged historical boreholes has not materially affected the pre-license water quality data or the interpretation of pumping test data to determine aquifer properties. As Joint Intervenors have demonstrated, however, the Staff did not conduct the testing necessary to assess aquifer properties, and the testing that was conducted indicates communication between the SM and OZ horizons that further highlights the concerns with unplugged boreholes. JTI FOF/COL ¶¶ 218-222; *see also* Transc. at 769 as (Dr. Abitz explaining that the testing conducted provided "no demonstration of no connectivity between the horizons when you're running an extraction process in a wellfield for two or three years. So I stand on that. There's no science presented that shows there will be no communication between the aquifers when you run a production center for two or three years.").

68. Staff seeks to defend the single well pumping test conducted on the grounds that it is consistent with NRC guidance and provided the requisite information, and that more accurate information will be collected later. Staff FOF/COL ¶ 6.56-6.57; *see also* SEI

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authority to consider any fact that could be considered in federal court at any time "before final decision"); Fed. R. Evid. 201(b) (permitting consideration of facts that "can be accurately and readily determined from sources whose accuracy cannot reasonably be questioned").

FOF/COL 10.124-10.131 (discussing post-NEPA data collection plans). However, as Joint Intervenors have demonstrated, the small number of wells and short duration of the tests were insufficient to provide the necessary hydrological information on the site, JTI FOF/COL ¶¶ 219-222. Once again, it is not sufficient for NEPA purposes for Staff to defer collection of adequate data until long after the NEPA decision has been made.

69. Staff also disputes that the testing showed "evidence of direct communication between the overlying and OZ aquifer," Staff FOF/COL ¶¶ 6.59 and 6.60, but has not meaningfully disputed Dr. Abitz's interpretation of the data. JTI001-R at 49-50. Strata conducted 7 pump tests from July 7, 2010 to July 27, 2010. Contrary to Staff's assertion that these tests were all 72 hour, in fact *six* of the pump tests lasted approximately 24 hours, while only *one* pump test (well 12-18OZ) lasted approximately 72 hours. *See* SEI048 at 3. Moreover, SEI's own witnesses have testified that the data from these pump tests was *not* intended to demonstrate adequate OZ confinement throughout the entire Ross Project area. *See* Testimony of Ray Moores (SEI042) at 6 ("These aquifer tests demonstrate confinement only over the local area of influence. They were not designed nor intended to demonstrate confinement throughout the entire Ross Project area."); *see also* Transc. at 685 (MR. SCHIFFER: We had one test of 72 hours. And I think that that would be on the pre-licensing. I think that that would be likely a minimum test duration in a raw field hydrologic test"). Staff also does not refute that Joint Intervenors' witness demonstrated historical use of pump tests were not successful at predicting either the potential for vertical excursions or their precise cause, such as thinning confining layers,

unsealed boreholes, or failed active wells, and/or heterogeneity in the fluvial sediments. *See* JTI003-R at 52-53.

70. Staff's assertion (at ¶ 6.60) that the results from wells 12-18OZ and 22X-19 do not indicate a lack of aquifer confinement is not persuasive. Staff's assertion that the wells were screen through different horizons is not supported by any citation or reference.

3. Failure to Demonstrate That Excursions Will Be Detected And Remediated

71. Staff claims that if excursions occur they will be detected and remediated. Staff FOF/COL ¶ 6.52; *see also* SEI FOF/COL ¶¶ 10.132-10.164. As Joint Intervenors have demonstrated, the FSEIS does not adequately demonstrate the detection of excursions given the numerous such excursions documented at other sites, and the inadequate approach taken to excursion detection at the Ross project. JTI FOF/COL ¶¶ 225-239. Staff has also not characterized the site in the manner necessary to develop any degree of scientific certainty that excursions can be remediated even if detected. JTI FOF/COL ¶¶ 219; 238; *see also* Transc. at 750 (Dr. Abitz: "Fluvial stratigraphy by nature is very complex. And as we heard from the NRC staff, it can thin and be absent. Confining layers can be absent. So plugging bore holes is not enough to ensure that vertical excursions will not occur" without obtaining "a very detailed stratigraphic model showing where the thinning horizons are in the sand units").

72. Staff asserts that it is not necessary to rely on uranium as an excursion parameter in order to detect excursions. Staff FOF/COL ¶ 6.61; *see also* SEI FOF/COL ¶¶ 10.132-10-143. They base this conclusion on the assumption that other constituents will move more rapidly. *Id.* Joint Intervenors have demonstrated that, to the contrary, uranium may

travel faster than the excursion parameters, in light of the highly mobile, aqueous uranium-carbonate species formed from the lixiviant injections, and have supported that conclusion with evidence of uranium excursions from other sites. *See* JTI FOF/COL ¶ 234; *see also* Transc. at 781 (Dr. Abitz explanation that "uranium has been used as an excursion indicator in the past. And we haven't seen any numbers to show what the ratio is of sulfate and alkalinity in the lixiviant compared to the monitor well ring."). Joint Intervenors have also demonstrated that lixiviant introduction is likely to significantly elevate uranium concentrations long after the Ross project, thereby further increasing the risks of uranium excursions. JTI FOF/COL ¶ 235.

73. Staff claims that the Board can ignore the FSEIS conclusion that there could be temporarily LARGE impacts from excursions because those impacts would not affect "an area being used for consumption." Staff FOF/COL ¶ 6.58. Once again, this ignores the obligation to evaluate and disclose impacts to the environment irrespective of anticipated human uses.

74. SEI claims that the frequency of excursions does not indicate environmental impacts. SEI FOF/COL ¶¶ 10.144-164. Staff ignores Joint Intervenors' evidence demonstrating the adverse impacts associated with excursions at other sites, JTI FOF/COL ¶¶ 225-230, and fails to substantiate that similar impacts are not likely for the Ross project.

IV. PROPOSED ORDER

75. In light of the foregoing, the Board hereby DECLARES that the NRC violated NEPA and implementing regulations and requirements in the Ross Project environmental review; VACATES the April 24, 2014 Record of Decision for the Ross Project

(NRC009), and the April 24, 2014 NRC Materials License for the Ross Project (SEI015); and REMANDS to the NRC Staff to proceed in a manner consistent with the Board's factual findings and legal conclusions.

75. In accordance with 10 C.F.R. § 2.341(b)(1), any party to this proceeding may file a petition for review of this Initial Decision with the Commission within twenty-five (25) days after service. In accordance with 10 C.F.R. § 2.340(g) and § 2.1210, this Initial Decision shall constitute the final decision of the Commission forty (40) days after its issuance, unless there is a petition for Commission review filed, or the Commission decides to review this Initial Decision under 10 C.F.R. §2.1210(a)(2) or (3).

Respectfully submitted,

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Date: November 17, 2014

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing *Proposed Response to SEI's and Staff's Proposed Findings of Fact & Conclusions of Law* in the captioned proceeding were served via the Electronic Information Exchange ("EIE") to the Board and all other parties on the 17th day of November 2014, which to the best of my knowledge resulted in transmittal of same.

(electronic signature)
Shannon Anderson

Date: November 17, 2014