

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
ATOMIC SAFETY AND LICENSING BOARD

_____)	
In the Matter of)	
)	
Entergy Nuclear Operations, Inc.)	Docket Nos.
(Indian Point Nuclear Generating)	50-247-LR
Units 2 and 3))	and 50-286-LR
_____)	

**RIVERKEEPER AND HUDSON RIVER SLOOP CLEARWATER
REVISED STATEMENT OF POSITION REGARDING CONSOLIDATED
CONTENTION RK-EC-3/CW-EC-1 (SPENT FUEL POOL LEAKS)**

July 13, 2012

TABLE OF CONTENTS

BACKGROUND	2
APPLICABLE LEGAL AND REGULATORY REQUIREMENTS.....	6
ARGUMENT	12
I. Entergy and NRC Staff Have Failed to Demonstrate that Potential Human Health Impacts Due to SFP and Groundwater Contamination at Indian Point are “SMALL” or Have Been Adequately Considered	12
II. Entergy and NRC Staff Have Failed to Demonstrate that Groundwater Quality Impacts Due to SFP and Groundwater Contamination at Indian Point are “SMALL” or Have Been Adequately Considered	18
III. Entergy and NRC Staff have Failed to Demonstrate that Aquatic Ecology Impacts Due to SFP and Groundwater Contamination at Indian Point are “SMALL” or Have Been Adequately Considered	27
IV. Entergy Mischaracterizes the Significance of IP1 SFP Leaks and Entergy and NRC Staff have Failed to Demonstrate that IP1 SFP Leaks Have Been Adequately Considered	30
V. Entergy and NRC Staff have Failed to Demonstrate that Future Radiological Leaks Have Been Adequately Considered, and the Conclusion that Environmental Impacts from SFP Leaks and Groundwater Contamination at Indian Point “Will Likely Remain SMALL” is Unfounded	34
VI. Entergy and NRC Staff have Failed to Demonstrate that Mitigation Alternatives Relating to SFP Leaks and Radiological Contamination at Indian Point Have Been Adequately Considered	37
CONCLUSION.....	41

In accordance with 10 C.F.R. § 2.1207(a)(2), the Atomic Safety and Licensing Board's ("ASLB") July 1, 2010 Scheduling Order,¹ the ASLB's April 18, 2012 Order,² and the ASLB's oral ruling made during the conference call held among the parties on July 9, 2012,³ Riverkeeper, Inc. ("Riverkeeper") and Hudson River Sloop Clearwater, Inc. ("Clearwater") (collectively referred to as "Intervenors"), hereby submit this Revised Statement of Position in response to (1) Entergy Nuclear Operations, Inc.'s ("Entergy") Statement of Position on Consolidated Contention RK-EC-3/CW-EC-1 (Spent Fuel Pool Leaks) (ENT000300), the Testimony of Entergy Witnesses Donald M. Mayer, Alan B. Cox, Thomas C. Esselman, Matthew J. Barvenik, Carl J. Papierierllo, and F. Owen Hoffman Regarding Consolidated Contention RK-EC-3/CW-EC-1 (Spent Fuel Pool Leaks) (ENT000301), and exhibits thereto (ENT000031, ENT00269A, ENT00269B, ENT000302 to ENT000371), filed in the above-captioned proceeding on March 29, 2012, and (2) the U.S. Nuclear Regulatory Commission ("NRC") Staff's Statement of Position Concerning Contention Riverkeeper EC-3/Clearwater EC-1 (Spent Fuel Pool Leaks) (NRC000087), NRC Staff Testimony of Stephen P. Klementowicz and James D. Noggle Concerning Contention Riverkeeper EC-3/Clearwater EC-1 (Spent Fuel Pool Leaks) (NRC000088), and exhibits thereto (NRC000089 to NRC000100), filed in the above-captioned proceeding on March 30, 2012.

¹ In the Matter of Entergy Nuclear Operations, Inc. (Indian Point Nuclear Generating Units 2 and 3), Docket Nos. 50-0247-LR and 50-286-LR, ASLBP No. 07-858-03-LR-BD01, Scheduling Order (July 1, 2010), at ¶ K.3.

² In the Matter of Entergy Nuclear Operations, Inc. (Indian Point Nuclear Generating Units 2 and 3), Docket Nos. 50-0247-LR and 50-286-LR, ASLBP No. 07-858-03-LR-BD01, Order (Memorializing Items Discussed at April 16, 2012 Pre-Hearing Conference) (April 18, 2012) at 1 (explaining that "Intervenors' revised statements of position filed pursuant to Paragraph K.3 of the Board's July 1, 2010,[] should only respond to the statements of position and evidentiary submissions of Entergy Nuclear Operations, Inc. (Entergy) and the NRC Staff. At this stage of this proceeding, Intervenors should not revise their entire original statements of position but rather present only responsive arguments").

³ Official Transcript of Proceedings, Nuclear Regulatory Commission, Entergy Nuclear Operations Indian Point Plant Units 2 and 3, Docket Number: 50-247-LR, 50-286-LR, ASLBP Number: 07-858-03-LR-BD01, Monday July 9, 2012, Pages 1141-1192, at 1188-89.

This revised Statement of Position is supported by several additional exhibits in support of Consolidated Contention RK-EC-3/CW-EC-1 (RIVR00090, and RIV000121 to RIV000126). For the reasons discussed below and in Intervenor's Initial Statement of Position Regarding Consolidated Contention RK-EC-3/CW-EC-1 (Spent Fuel Pool Leaks) (RIV000059), Entergy and NRC Staff's have failed to adequately assess all relevant, past, present, foreseeable, and cumulative, impacts posed by spent fuel pool ("SFP") leaks and groundwater contamination at the Indian Point nuclear power plant, and the ASLB should resolve Consolidated Contention RK-EC-3/CW-EC-1 in Intervenor's favor.

BACKGROUND

The procedural history of Consolidated Contention RK-EC-3/CW-EC-1, which concerns the insufficiency of Entergy and NRC Staff's environmental analyses of SFP leaks at Indian Point, is described in Intervenor's Initial Statement of Position Regarding Consolidated Contention RK-EC-3/CW-EC-1 (Spent Fuel Pool Leaks) ("Intervenor's Initial Statement of Position").⁴ Intervenor's Initial Statement of Position, along with the testimony of Riverkeeper's witnesses, Mr. Arnold Gundersen⁵ and Ms. Gillian Stewart,⁶ as well as numerous exhibits, were filed in the proceeding on December 22, 2011 in support of Consolidated Contention RK-EC-3/CW-EC-1.

Following Intervenor's extensive initial filings on RK-EC-3/CW-EC-1, on January 30, 2012, Entergy filed a motion *in limine*, seeking to exclude large portions of Intervenor's

⁴ Riverkeeper and Hudson River Sloop Clearwater Statement of Position Regarding Consolidated Contention RK-EC-3/CW-EC-1 (Spent Fuel Pool Leaks) (December 22, 2011) (RIV000059) (hereinafter cited as "Intervenor's Initial Statement of Position"), at 1-8.

⁵ Prefiled Direct Testimony of Arnold Gundersen Regarding Consolidated Contention RK-EC-3/CW-EC-1 (Spent Fuel Pool Leaks), December 21, 2012 (RIV000060) ("Gundersen Testimony").

⁶ Prefiled Written Testimony of Gillian Stewart Regarding Consolidated Contention RK-EC-3/CW-EC-1 (Spent Fuel Pool Leaks), December 22, 2012 (RIV000061) ("Stewart Testimony").

testimony, exhibits and initial statement of position.⁷ Entergy's motion alleged that Intervenor's witnesses lacked relevant expertise and improperly discussed the following: (1) documented radiological leaks, spills, and releases from systems, structures, and components ("SSCs") other than the Indian Point SFPs, that indisputably contribute to existing groundwater contamination plumes at the site (2) the inadequacy of Entergy's aging management programs ("AMPs") concerning such other SSCs, (3) varying alternatives for site remediation at Indian Point, (4) potential health impacts posed by SFP leaks at Indian Point that neither Entergy nor NRC Staff considered in their environmental assessments, (5) Entergy and NRC Staff's failure to discuss or consider the potential benefits of regular public disclosure of groundwater monitoring information, (6) relevant statements made by NRC in the draft Generic Environmental Impact Statement for License Renewal of Nuclear Plants, NUREG-1437, Revision 1; (7) leaks from the Unit 1 SFPs, which have unquestionably resulted in a plume of groundwater contamination at the Indian Point site that has released and continues to release into the Hudson River; (8) the inadequacy of Entergy's maintenance funding, and (9) Entergy's response to radiological leak issues at its Vermont Yankee nuclear power plant.⁸

Intervenor's opposed Entergy's attempt to improperly limit the scope of Consolidated Contention RK-EC-3/CW-EC-1, explaining the patent relevance of all of the issues in question to RK-EC-3/CW-EC-1, as it was admitted, as well as Intervenor's witnesses' adequate qualifications to testify about such issues.⁹ On March 6, 2012, the ASLB denied in part and

⁷ Entergy's Motion *in Limine* to Exclude Portions of Pre-Filed Direct Testimony and Exhibits for Contention RK-EC-3/CW-EC-1 (Spent Fuel Pool Leaks) (January 30, 2012), ("Entergy's Motion *in Limine* on RK-EC-3/CW-EC-1").

⁸ Entergy's Motion *in Limine* on RK-EC-3/CW-EC-1 at 5-19.

⁹ Riverkeeper, Inc. and Hudson River Sloop Clearwater, Inc. Opposition to Entergy's Motion in Limine to Exclude Portions of Pre-Filed Testimony and Exhibits for Contention RK-EC-3/CW-EC-1 (February 17, 2012), ADAMS Accession No. ML12048B457, at 4-18 ("Intervenor's Opposition to Entergy Motion *in Limine* on RK-EC-3/CW-EC-1").

granted in part Entergy's Motion *in Limine*.¹⁰ In particular, the ASLB granted Entergy's Motion *in Limine* only with respect to "specific statements made by Mr. Gundersen in RIV000060 that discuss leaks, spills, and releases from non-SFP SSCs [systems, structures, and components], and challenge the adequacy of the AMPs for the aforementioned non-SFP SSCs at Indian Point," and in relation to two proffered exhibits (RIV000079 and RIV000089) which discuss these topics.¹¹ In making this ruling, the ASLB acknowledged the general relevance of such information in terms of "the distribution and concentration of specific radionuclides in the groundwater," since such issues are "a major foundation of RK-EC-3/CW-EC-1."¹² The ASLB further took "administrative notice that if releases from SFP leaks encounter groundwater, then the radionuclides would co-mingle and coalesce with any impacts that might be present from other sources" and that "the impacts to groundwater from SFP leaks and the subsequent discharges into the Hudson River could only be assessed on a site-wide basis."¹³ With respect to Entergy's various other objections to Intervenor's initial hearing submissions, the ASLB ruled that "[t]he Motion to exclude the remaining RK-EC-3/CW-EC-1 topics raised by Entergy is denied."¹⁴

Intervenors thereafter filed a Motion for Reconsideration and/or Clarification of the ASLB's ruling on Entergy's Motion *in limine*, respectfully disagreeing with the ASLB's exclusion of relevant portions of Intervenor's proffered testimony and exhibits.¹⁵ However,

¹⁰ In the Matter of Entergy Nuclear Operations, Inc. (Indian Point Nuclear Generating Units 2 and 3), Docket Nos. 50-0247-LR and 50-286-LR, ASLBP No. 07-858-03-LR-BD01, Order (Granting in Part and Denying in Part Applicant's Motions *in Limine*) (March 6, 2012), at 31 ("ASLB March 6, 2012 Ruling on Entergy Motions *in Limine*").

¹¹ ASLB March 6, 2012 Ruling on Entergy Motions *in Limine* at 31

¹² *Id.* at 29.

¹³ *Id.*

¹⁴ *Id.*

¹⁵ Riverkeeper, Inc. and Hudson River Sloop Clearwater, Inc.'s Motion for Reconsideration and/or Clarification of the ASLB's Ruling on Entergy's Motion *in Limine* to Exclude Portions of Pre-Filed Testimony and Exhibits for

despite Intervenor's explanation regarding the clear relationship between Contention RK-EC-3/CW-EC-1 and non-SFP leaks and Entergy's inadequate AMPs for non-SFP leak-prone components (since both excluded issues implicate a current and/or potential future cumulative impact that neither Entergy nor NRC Staff considered in assessing SFP leaks at Indian Point),¹⁶ the ASLB denied Intervenor's motion.¹⁷ The ASLB did once again clarify that "[t]o the extent that [SFP] leakage co-mingles and coalesces with other leakage sources in contamination plumes and, likely, cannot be separately attributed to the SFPs, we will assess its impacts on groundwater and the Hudson River ecosystem on a site-wide basis."¹⁸ In any event, Intervenor continues to respectfully disagree with the ASLB decision to grant in part Entergy's Motion *in Limine*.¹⁹

Subsequent to the disposition of Entergy's Motion *in Limine*, on March 29, 2012 and March 30, 2012, Entergy and NRC Staff submitted statements of position, testimony, and exhibits related to RK-EC-3/CW-EC-1, respectively.²⁰ Statements and arguments responsive to

Contention RK-EC-3/CW-EC-1 (March 16, 2012), ADAMS Accession No. ML12076A304, at 4-18 ("Intervenor's Motion for Reconsideration").

¹⁶ See Intervenor's Motion for Reconsideration at 2-8.

¹⁷ In the Matter of Entergy Nuclear Operations, Inc. (Indian Point Nuclear Generating Units 2 and 3), Docket Nos. 50-0247-LR and 50-286-LR, ASLBP No. 07-858-03-LR-BD01, Order (Denying Riverkeeper's and Clearwater's Motion for Reconsideration and/or Clarification) (March 22, 2012) at 4 ("ASLB March 22, 2012 Ruling on Intervenor Motion for Reconsideration").

¹⁸ ASLB March 22, 2012 Ruling on Intervenor Motion for Reconsideration at 3.

¹⁹ By abiding by the ASLB's ruling, Intervenor does not waive their rights with regard to the scope of Consolidated Contention RK-EC-3/CW-EC-1.

²⁰ Entergy's Statement of Position on Consolidated Contention RK-EC-3/CW-EC-1 (Spent Fuel Pool Leaks), March 29, 2012 (ENT000300) (hereinafter cited as "Entergy's Statement of Position"); Testimony of Entergy Witnesses Donald M. Mayer, Alan B. Cox, Thomas C. Esselman, Matthew J. Barvenik, Carl J. Papierillo, and F. Owen Hoffman Regarding Consolidated Contention RK-EC-3/CW-EC-1 (Spent Fuel Pool Leaks), March 29, 2012 (ENT000301) (hereinafter cited as "Entergy Testimony"); Entergy Exhibits ENT000031, ENT00269A, ENT00269B, ENT000302 to ENT000371; NRC Staff Statement of Position Concerning Contention Riverkeeper EC-3/Clearwater EC-1 (Spent Fuel Pool Leaks), March 30, 2012 (NRC000087) (hereinafter cited as "NRC Staff's Statement of Position"); NRC Staff Testimony of Stephen P. Klementowicz and James D. Noggle Concerning Contention Riverkeeper EC-3/Clearwater EC-1 (Spent Fuel Pool Leaks), March 30, 2012 (NRC000088) (hereinafter cited as "NRC Staff's Testimony"); NRC Staff Exhibits NRC000089 to NRC000100).

the statements, testimony, and evidence submitted by Entergy and NRC Staff relating to Consolidated Contention RK-EC-3/CW-EC-1 are described below.

APPLICABLE LEGAL AND REGULATORY REQUIREMENTS

Intervenors' Initial Statement of Position discussed in detail the legal and regulatory requirements relevant to Consolidated Contention RK-EC-3/CW-EC-1.²¹ Intervenors offer the following additional statements in response to Entergy and NRC Staff's articulation of applicable legal and regulatory standards in their respective statements of position, and in their witness testimony.

First, Entergy's statements about "controlling NEPA principles" appear to be somewhat misleading in relation to the proper scope of a NEPA analysis.²² Thus, several clarifications are warranted. First, while an environmental impact statement ("EIS") need not be "so all-encompassing" that preparing it would become "impossible,"²³ it is indisputable that an EIS must provide "such information as appears to be *reasonably necessary* under the circumstances *for evaluation of the project*."²⁴ Moreover, with respect to the "rule of reason" that governs the implementation of NEPA, it must be noted that this rule is meant to "ensure[] that agencies determine whether and to what extent to prepare an EIS based on the usefulness of any new potential information to the decisionmaking process."²⁵ Lastly, while NEPA does not require an assessment of "remote and highly speculative consequences" of the proposed action,²⁶ NEPA

²¹ Riverkeeper's Initial Statement of Position at 8-20.

²² See Entergy's Statement of Position at 10.

²³ See *id.*

²⁴ *New York v. Kleppe*, 429 U.S. 1307, 1311 (1976) (quoting *Natural Resources Defense Council v. Callaway*, 524 F. 2d 79, 88 (1975) (emphasis added).

²⁵ *Dep't of Transp. v. Public Citizen*, 541 U.S. 752, 767 (2004) (citing *Marsh v. Oregon Natural Resources Council*, 490 U.S. 360, 373-74 (1989)).

²⁶ See Entergy's Statement of Position at 10 (stating that NEPA does not require an estimate of "unduly speculative" impacts); *Trout Unlimited v. Morton*, 509 F.2d 1276, 1283 (9th Cir. 1974).

does unquestionably require that “agencies must examine the ‘reasonably foreseeable’ environmental effects of their proposed actions when conducting environmental review.”²⁷

Next, while both Entergy and NRC Staff discuss NRC regulations implementing NEPA, they both fail to acknowledge, or even mention, a pending update to the Generic Environmental Impact Statement License Renewal of Nuclear Plants (“GEIS”) (that is, proposed Revision 1 to this report) which contains relevant information about the appropriate scope of the site-specific NEPA review that must be conducted at Indian Point.²⁸ Intervenor’s Initial Statement of Position²⁹ and Opposition to Entergy’s Motion *in Limine* on Contention RK-EC-3/CW-EC-1,³⁰ discussed the relevance and usefulness of the information contained in the GEIS update. Notably, the ASLB squarely rejected Entergy’s attempt to exclude discussion of the GEIS update in the context of Contention RK-EC-3/CW-EC-1.³¹

Next, Entergy alleges that “any challenge to human health impacts that turns on contesting the conclusion that SMALL effects will occur absent a violation of NRC dose

²⁷ *Ground Zero Ctr. for Non-Violent Action v. United States Dep’t of the Navy*, 383 F.3d 1082, 1089 (9th Cir. Wash. 2004); see also *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 356 (1989).

²⁸ Entergy’s Statement of Position at 11-12; NRC Staff’s Statement of Position at 4-8.

²⁹ See Intervenor’s Initial Statement of Position at 14, 16; see also NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*, Revision 1, Draft Report for Comment, available at, <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/r1/v1/sr1437r1v1.pdf> (hereinafter “GEIS Update”) (Exhibit RIV000064).

³⁰ Intervenor’s Opposition to Entergy Motion *in Limine* on RK-EC-3/CW-EC-1 at 20 (“Entergy’s Motion in Limine, supported by NRC Staff, requests the exclusion of an excerpt of the NRC’s Draft GEIS concerning nuclear power plant license renewal, which Intervenor submitted as a hearing exhibit in support of the Consolidated Contention. The ASLB should deny this request. Although the rulemaking process relating to the draft GEIS is still ongoing, the statements contained therein constitute statements and positions of a party to the proceeding, and in particular, a party that opposes the issues raised by Consolidated Contention. Though the Draft GEIS is not yet binding guidance, NRC Staff’s statements relating to the appropriateness of the environmental review of accidental radiological leaks in the draft GEIS are relevant to, and will assist the ASLB’s understanding of, issues raised in the Consolidated Contention.”).

³¹ ASLB March 6, 2012 Ruling on Entergy Motions *in Limine* at 31 (ruling that the “[m]otion to exclude the remaining RK-EC-3/CW-EC-1 topics raised by Entergy [which included Intervenor’s discussion of the NRC’s GEIS update] is denied.”).

regulations is contrary to Table B-1 and impermissible.”³² However, a finding that the accidental radiological leaks and groundwater contamination at Indian Point result in an “acceptable” dose as calculated pursuant to NRC dose regulations *does not* absolve Entergy and NRC Staff from fully considering potential impacts to public health and safety *under NEPA*. Indeed, it is well settled that an NRC finding of adequate protection of public health and safety under the Atomic Energy Act does not preclude the need for further consideration of a particular issue under NEPA.³³ NRC’s dose regulations were “issued under the Atomic Energy Act.”³⁴ Thus, whether or not the SFP leaks at Indian Point result in a dose to the public that complies with NRC’s dose regulations, does not end the inquiry in the context of an environmental review pursuant to NEPA. As such, Intervenor’s disagree with Entergy’s above-referenced position. The identification of *additional* matters that are relevant to the question of whether the SFP leaks may impact public health and safety are matters that are critical and necessary to a complete NEPA review, and which do not constitute impermissible challenges to NRC dose regulations.

Indeed, the ASLB has already rejected Entergy’s position at numerous junctures in this proceeding. First, at the initial contention admissibility stage of the case, the ASLB found that despite Entergy’s claim that the dose resulting from the groundwater contamination at Indian Point was “well below the NRC limit,” Clearwater’s proffered contention was “*not* an impermissible challenge to Commission regulations” since there was still a question relating to

³² Entergy’s Statement of Position at 13.

³³ *Limerick Ecology Action, Inc. v. NRC*, 869 F.2d 719 (3d 1989); *see id.* (explaining that the language of NEPA, which requires agencies to comply “to the fullest extent possible,” indicates that Congress did not intend that NEPA review be precluded by the Atomic Energy Act (“AEA”). Since there is no language in the AEA to indicate that the AEA precludes NEPA review, the legislative history of the phrase “to the fullest extent possible” indicates that Congress intended that NEPA not be limited by other statutes by implication).

³⁴ 10 C.F.R. § 20.1001.

the maximum groundwater impact of the contamination and the maximum dose.³⁵ Thus, the ASLB indicated that an inquiry into the maximum impact of the groundwater contamination *is not* impermissible. The ASLB similarly found that Riverkeeper's initial contention was admissible despite Entergy's assertions that the SFP leaks are "not significant" because the resulting dose to the public is "minimal," since Riverkeeper asserted that the release concentrations were "not low."³⁶ Thus, Riverkeeper's position that additional impacts had yet to be assessed also did not constitute an impermissible challenge to NRC dose regulations.

In ruling upon Entergy's Motion *in Limine* relating to Consolidated Contention RK-EC-3/CW-EC-1, the ASLB once again explained Entergy's incorrect mischaracterization of the appropriateness of raising concerns about the groundwater contamination at Indian Point notwithstanding whether such contamination complies with NRC dose regulations:

Riverkeeper and Clearwater have questioned whether Entergy's and the NRC Staff's conclusions regarding the insignificance of the groundwater contamination are sufficient for purposes of satisfying NEPA and NRC regulations. As we have stated before, these are not challenges to NRC dose exposure regulations for addressing public health and safety, but rather a challenge to the adequacy of the NEPA review of this environmental impact. The Board finds that Riverkeeper and Clearwater testimony on the environmental impacts from radionuclides released from SFPs to the groundwater at Indian Point is well within the admitted bounds of RK-EC-3/CW-EC-1, and is not a direct challenge to dose regulations.³⁷

³⁵ See *In the Matter of Entergy Nuclear Operations, Inc. (Indian Point Nuclear Generating Units 2 and 3)*, Docket Nos. 50-247-LR and 50-286-LR, ASLBP No. 07-858-03-LR-BD01, Memorandum and Order (Ruling on Petitions to Intervene and Requests for Hearing) (July 31, 2008), ADAMS Accession No. ML082130436, at 187-88, 192 (hereinafter "ASLB July 31, 2008 Contention Admissibility Order").

³⁶ *Id.* at 188.

³⁷ ASLB March 6, 2012 Ruling on Entergy Motions *in Limine* at 30-31.

It is, thus, clear that Entergy's position that the level of environmental impacts of accidental radiological leaks and groundwater contamination at Indian Point must *only* hinge upon whether such leaks and contamination result in a violation of NRC dose regulations, is wrong.

Moreover, Entergy's reliance on the statement made in Table B-1 of Part 51, that "those impacts that do not exceed permissible levels in the Commission's regulations are considered small,"³⁸ is otherwise unsupported. Table B-1 memorializes the conclusions of the NRC's original 1996 GEIS.³⁹ However, the environmental impacts of accidental radiological leaks *were not assessed* in the GEIS.⁴⁰ As a result, the conclusions contained in Table B-1 of Part 51 pertaining to the assessment of "radiological impacts" simply do not apply to the impacts of accidental radiological leaks. This issue was not contemplated at all in the formulation of the Commission's conclusions concerning radiological impacts. As a result, a full consideration of the potential impacts of accidental radiological leaks and groundwater contamination at Indian Point is necessary.⁴¹

Furthermore, Entergy articulates standards relating to the applicable burden of proof for Contention RK-EC-3/CW-EC-1.⁴² In response to these statements, it is noteworthy to highlight that, while, as Entergy points out, an intervenor must go forward with evidence to establish a

³⁸ See Entergy's Statement of Position at 12.

³⁹ See 10 C.F.R. § Part 51 Appendix B to Subpart A--Environmental Effect of Renewing the Operating License of a Nuclear Power Plant.

⁴⁰ See GEIS Update at 4-40 (Exhibit RIV000064) ("The following nine issues concern impacts on groundwater that may occur during the license renewal term . . . Radionuclides released to groundwater (*new issue not considered in the 1996 GEIS*)" (emphasis added)).

⁴¹ See ASLB July 31, 2008 Contention Admissibility Order at 187-88 ("Even though the NRC Staff claims that Riverkeeper's allegations are an impermissible challenge to the regulations, Entergy is required to address new and significant information for either Category 1 or Category 2 issues in its ER for a LRA. Leaks from the spent fuel pools are new information. . .").

⁴² Entergy Statement of Position at 17-18.

prima facie case on an admitted contention,⁴³ generally, “the agency’s rules of practice . . . place the ultimate burden of proof of *any substantive matter at issue* (i.e., the admitted [] contention) on the applicant.”⁴⁴ As Entergy explains, NRC Staff has the “ultimate burden of complying with [NEPA].”⁴⁵

Lastly, NRC Staff takes the position that the environmental review to be conducted pursuant to NEPA relating to the license renewal of Indian Point “need not discuss any aspect of the storage of spent fuel for the facility within the scope of the generic determination in § 51.23(a) and in accordance with § 51.23(b).”⁴⁶ Notably, NRC Staff’s hearing submissions were filed prior to a recent D.C. Circuit Court of Appeals ruling, which invalidated the referenced generic (waste confidence) determination.⁴⁷ As a result, an environmental analysis of the long-term impacts of on-site spent fuel storage is no longer excluded from review.⁴⁸ Thus, to the extent NRC Staff’s assessment of the impact of SFP leaks and radiological contamination at Indian Point was limited by the exclusion previously set forth in 10 CFR § 51.23(b), NRC Staff’s review is insufficient.

⁴³ Entergy Statement of Position at 17.

⁴⁴ In the Matter of Pacific Gas and Electric Co. (Diablo Canyon Power Plant Independent Spent Fuel Storage Installation) Docket No. 72-26-ISFSI; ASLBP No. 02-801-01-ISFSI, 58 NRC 47, *12; 2003 (2003); *see also* In the Matter of Carolina Power & Light Company (Shearon Harris Nuclear Power Plant), Docket No. 50-400-LA; ASLBP No. 99-762-02-LA; LBP-00-12, 51 NRC 247 (2000) (“the agency’s rules of practice . . . place the ultimate burden of proof on CP&L, as the license applicant, with respect to a merits disposition of any substantive matter at issue in this proceeding (i.e., the admitted BCOC contentions”).

⁴⁵ *See Duke Power Co.* (Catawba Nuclear Station, Units 1 & 2), CLI-83-19, 17 NRC 1041, *23 (1983).

⁴⁶ NRC Staff’s Statement of Position at 43-44; *see also id.* at 5 (fn.14).

⁴⁷ *See State of New York v. Nuclear Regulatory Commission*, No. 11-1045 (June 8, 2012).

⁴⁸ *See generally* State of New York, Riverkeeper, Inc., and Hudson River Sloop Clearwater’s Joint Contention NYS-39/RK-EC-9/CW-EC-10 Concerning the On-site Storage of Nuclear Waste at Indian Point (July 8, 2012).

ARGUMENT

I. Entergy and NRC Staff Have Failed to Demonstrate that Potential Human Health Impacts Due to SFP and Groundwater Contamination at Indian Point are “SMALL” or Have Been Adequately Considered

Entergy and NRC Staff attempt to refute Intervenor’s position that neither Entergy nor NRC Staff adequately assessed potential human health impacts relating to the SFP leaks and groundwater contamination at Indian Point. For the reasons explained below and in Intervenor’s Initial Statement of Position, these arguments are unconvincing, and it remains, at best, unclear whether the leaks and contamination can be characterized as “SMALL.”

First, both Entergy and NRC Staff take the position that radiological impacts that do not exceed NRC dose limits “are considered small.”⁴⁹ Entergy once again takes the position that “[a]ny claim objecting to releases within these limits amounts to an impermissible challenge to NRC regulations.”⁵⁰ As discussed at length above, as well as in Intervenor’s Initial Statement of Position, this position is misleading and simply incorrect.⁵¹ Entergy and NRC Staff fail to understand that a review *pursuant to NEPA*, requires a full consideration of potential impacts to public health, and not just a consideration of whether the leaks and contamination comply with NRC dose regulations.⁵² As the discussion in Intervenor’s Initial Statement of Position and the testimony of Intervenor’s witnesses indicate, it is far from clear that the impacts to human health are unequivocally “SMALL” in light of Entergy and NRC Staff’s failure to fully consider the issue.⁵³

⁴⁹ Entergy’s Statement of Position at 38 (quoting Table B-1 of Part 50), 41; NRC Staff’s Statement of Position at 54.

⁵⁰ Entergy’s Statement of Position at 38, 41.

⁵¹ See *supra* at pp. 7-10; Intervenor’s Initial Statement of Position at § Discussion II.B.v.

⁵² See *supra* at pp. 7-10; Intervenor’s Initial Statement of Position at § Discussion II.B.v; ASLB March 6, 2012 Ruling on Entergy Motions *in Limine* at 30-31.

⁵³ See Intervenor’s Initial Statement of Position at § Discussion II.B.v; Gundersen Testimony at 24; Stewart Testimony at 3, 5, 7.

Entergy and NRC Staff go on to dispute various concerns raised by Intervenor with respect to Entergy and NRC Staff's failure to adequately assess human health impacts resulting from SFP leaks and groundwater contamination at Indian Point.⁵⁴ However, Entergy and NRC Staff fail to demonstrate that Intervenor's concerns have been adequately addressed, as detailed below.

Recreational Exposure Pathways

Both Entergy and NRC Staff's submissions fail to adequately address concerns raised by Intervenor about the potential exposure to the radiological contamination at Indian Point through recreational exposure pathways.

Entergy claims that its witnesses "demonstrate" that if other exposure pathways suggested by Intervenor (that is, additional foreseeable recreational pathways, and not only the fish ingestion pathway that is currently considered) had been considered, they would result in a dose impact that "would be a fraction of the already very small dose from fish consumption alone"⁵⁵; however, Entergy's witnesses merely cite to a document which provides an alleged rationalization for why "the only applicable pathways at IPEC are Fresh Water Fish and Salt Water Invertebrates," and a historic document from 1976 regarding licensee compliance with NRC dose requirements.⁵⁶ Neither of these documents, nor Entergy's witnesses, appear to actually "demonstrate" what the additional dose to the public would be due to the such other pathways of exposure to the radiological groundwater contamination at Indian Point. Entergy's witnesses simply make apparently unsupported assumptions about a cumulative dose, without

⁵⁴ Entergy's Statement of Position at 38-42.

⁵⁵ See *id.* at 39-40; Entergy's Testimony at A147.

⁵⁶ See Entergy's Statement of Position at 39-40; Entergy's Testimony at A147; ENT000329; ENT000330.

actually performing a site-specific assessment.⁵⁷ Moreover, Entergy and Entergy's witnesses' position improperly minimizes the importance of the scientific principle espoused in the BEIR VII report that all exposure to radiation produces a commensurate health risk, whether such exposure falls within NRC dose limits or not.⁵⁸

NRC Staff simply dismiss intervenors' concerns regarding recreational exposure pathways altogether.⁵⁹ This was based on NRC Staff's assertion that activities other than food intake, such as recreational activities, "do not result in a meaningful external exposure pathway."⁶⁰ Based on the evidence presented in intervenors' initial hearing filings, this approach is not well-founded, or compliant with NEPA.

Desalination Plant Impacts

Entergy and NRC Staff dispute intervenors' concerns relating to a *reasonably foreseeable*, and not a "remote and speculative" desalination facility that is currently planned to be sited just a few miles downstream of Indian Point in Haverstraw Bay.⁶¹ Both Entergy and NRC Staff take the position that a blind assurance to address this issue in the future is adequate: Entergy and Entergy's witnesses claim that when the desalination plant "becomes a reality," a potable water pathway would then be included in Entergy's dose calculations;⁶² NRC Staff and its witnesses likewise indicate that "if plans for the proposed Rockland County desalination plant advance to the licensing phase, the facility would be required to have the means to monitor the

⁵⁷ See Entergy's Testimony at A147.

⁵⁸ Intervenor's Initial Statement of Position at § Discussion II.B.v; Gundersen Testimony at 24; Stewart Testimony at 3, 5, 7; National Research Council, Health Risks from Exposure to Low Levels of Ionizing Radiation: BEIR VII – Phase 2 (2006) (RIV000093).

⁵⁹ NRC Staff's Statement of Position at 71.

⁶⁰ *Id.*

⁶¹ See generally Stewart Testimony.

⁶² Entergy's Statement of Position at 40; Entergy's Testimony at A149.

source water and, if necessary, have a treatment system to meet applicable drinking water standards for radioactivity and nonradioactive contaminants.”⁶³ However, these rationalizations fail to comply with NEPA, which requires a review of foreseeable environmental impacts *before* a decision of the proposed action is made.⁶⁴

Entergy further claims that the dose from such an additional pathway would not likely result in a material change to the current dose.⁶⁵ NRC Staff similarly asserts that relicensing Indian Point “is not expected to affect the Haverstraw project” since “Entergy’s radiological environmental monitoring program shows that liquid effluent releases from Indian Point, including groundwater discharges, do not result in detectable levels of tritium or other radionuclides in the Hudson River that would impact the EPA’s drinking water standards.”⁶⁶ However, these positions are problematic for several reasons: first, Entergy and NRC Staff once again ignore that fact, as explained in the BEIR VII report, notwithstanding the dose, the foreseeable exposure to the Indian Point leaks via the proposed drinking water pathway will have a commensurate health impact;⁶⁷ second, Entergy and NRC Staff fail to view the potential cumulative exposure via the proposed desalination plant pathway over the length of the entire relicensing term, that is, 20 years; third, Entergy appears to improperly assume that limited pilot plant data is entirely dispositive of whether a desalination plant will result in exposure to Indian Point contamination, *in the future*.

⁶³ NRC Staff’s Statement of Position at 73-74 (citing Exhibit NYS000133D, at A-95).

⁶⁴ See Intervenors’ Initial Statement of Position at 65.

⁶⁵ Entergy’s Statement of Position at 40-41; Entergy’s Testimony at A149.

⁶⁶ NRC Staff’s Statement of Position at 74-75.

⁶⁷ See Intervenors’ Initial Statement of Position at § Discussion II.B.v; Gundersen Testimony at 24; Stewart Testimony at 3, 5, 7; National Research Council, Health Risks from Exposure to Low Levels of Ionizing Radiation: BEIR VII – Phase 2 (2006) (RIV000093).

Further, Entergy claims that the radionuclides that have been detected in the desalination pilot plant data are not attributable to Indian Point, but rather to historic weapons testing, is misleading, and not entirely well-founded. For example, a more recent review of the proposed desalination plant, which Entergy claims “confirms” the alleged fact that detected radionuclides were not attributable to Indian Point, explicitly indicates that “[n]umerical model results show that compounds released from Indian Point are rapidly mixed by the estuary, spreading upstream and downstream and uniformly across the Hudson” and that “[c]ompounds released from Indian Point would reach the proposed Haverstraw Water Supply Project intake.”⁶⁸

Overall, it remains undisputed that radiological groundwater contamination discharges to the Hudson River and can migrate to the proposed intake location for this desalination project, and be taken up by the facility. Moreover, as Entergy’s witnesses acknowledge, tritium cannot be filtered out of the prospective drinking water.⁶⁹ Entergy’s and NRC Staff’s witnesses have failed to provide a sufficient assessment of the potential impacts posed by the proposed drinking water facility in order to make the alleged conclusion that the impact to the public from the operation of the proposed desalination plant “would be minimal.”⁷⁰ Based on the relevant facts, it remains far from unequivocal that the groundwater contamination at Indian Point will not result on an observable impact in relation to the proposed desalination plant.⁷¹

BEIR VII

Entergy and NRC Staff dispute Intervenors’ position that human health impacts may exist irrespective of whether the exposure meets NRC dose limits.

⁶⁸ United Water Haverstraw Water Supply Project 6 NYCRR Part 601 Water Supply Permit Application at 20 (ENT00320B). Notably, this

⁶⁹ See Entergy’s Testimony at A149.

⁷⁰ Entergy’s Statement of Position at 41; NRC Staff Statement of Position at 74-75.

⁷¹ See generally Stewart Testimony.

Entergy attempts to refute Intervenor's position by "directly demonstrate[ing] that the relevant dose is 'inconsequential.'"⁷² However, Entergy's position is not well-founded. For example, Entergy's position continues to revolve around Entergy's dose calculation; however, as Intervenor's have previously stated, this calculation fails to account for all relevant exposure pathways.⁷³ Thus, Entergy's claims about the total annual dose to the public from the groundwater contamination at Indian Point in 2010 is negligible, lacks adequate foundation. Notably, Entergy's "application" of the BEIR VII model to the 2010 calculated Indian Point dose, is likewise inaccurate, since, once again, that dose fails to consider relevant and foreseeable recreational and drinking water pathways. Moreover, Entergy extrapolates an alleged "negative human health effect" based upon *one* year of exposure (according to Entergy's limited dose calculation), to the groundwater contamination at Indian Point.⁷⁴ This clearly ignores the fact that exposure to the public from groundwater contamination at the plant has been occurring already for potentially decades, and will continue *throughout* the *entire* proposed period of extended operation.⁷⁵ That is, Entergy's assessment is misleading because it ignores the fact that there has been and will continue to be a cumulative exposure impact. Thus, Entergy's conclusion that there will be "no material" health impacts from the SFP leaks at Indian Point is unfounded.

NRC Staff attempts to refute Intervenor's position by simply alleging that there is "no regulatory basis" "that groundwater contamination at the Indian Point site should be evaluated based upon the 'BEIR VII' report."⁷⁶ NRC Staff improperly ignores the relevance of the BEIR

⁷² Entergy's Statement of Position at 41; Entergy's Testimony at A148

⁷³ Intervenor's Initial Statement of Position at

⁷⁴ Entergy's Statement of Position at 42; Entergy's Testimony at A148.

⁷⁵ See Gundersen Testimony at 22.

⁷⁶ NRC Staff's Statement of Position at 70.

VII report in the context of an environmental review pursuant to NEPA. As discussed at length in Intervenor's initial filings, as well as above, the existence of dose regulations does not preclude a comprehensive review of environmental impacts posed by proposed action in the context of a NEPA review.

In summary, Entergy and NRC Staff have failed to "conclusively demonstrate" (as Entergy alleges) that the dose consequences from the SFP leaks at Indian Point are "low" or that the leaks will not have some negative human health impact as a result of twenty additional years of operating the plant.⁷⁷ In light of the BEIR VII principle of a no-threshold, linear relationship between exposure and health risk,⁷⁸ which neither Entergy nor NRC Staff's witnesses appear to dispute,⁷⁹ there remains a credible risk of human health impacts that has yet to be adequately assessed.⁸⁰

II. Entergy and NRC Staff Have Failed to Demonstrate that Groundwater Quality Impacts Due to SFP and Groundwater Contamination at Indian Point are "SMALL" or Have Been Adequately Considered

Entergy and NRC Staff support their positions that the impact of SFP leaks and radiological contamination at Indian Point on groundwater quality is "SMALL" because the plumes are allegedly decreasing, and since there are no users for onsite groundwater.⁸¹ These assertions are unpersuasive. For the reasons discussed at length in Intervenor's Initial Statement of Position and witness testimony, the level of contamination at Indian Point has remained at

⁷⁷ Entergy's Statement of Position at 42; Entergy's Testimony at A148.

⁷⁸ National Research Council, Health Risks from Exposure to Low Levels of Ionizing Radiation: BEIR VII – Phase 2 (2006) (RIV000093).

⁷⁹ See Entergy's Testimony A148; NRC Staff's Statement of Position at 70.

⁸⁰ See Gundersen Testimony at 24.

⁸¹ See Entergy's Statement of Position at 42-43; Entergy's Testimony at A137; *see also* Entergy's Statement of Position at 27, 29-32; Entergy's Testimony at A70, A99; *see* NRC Staff's Statement of Position at 65, 67.

objectively high levels for years and continues to do so.⁸² In particular, the most recent data reviewed at the time of Intervenor's initial hearing submissions on Contention RK-EC-3/CW-EC-1, that is, the data from the second sampling quarter of 2011, showed that the levels of contamination in the groundwater continued to exceed U.S. Environmental Protection Agency ("EPA") standards for radionuclides in drinking water.⁸³

As previously explained, EPA drinking water standards are an oft-referenced-to benchmark, which provide a frame of reference in which to assess the level of contamination in the groundwater.⁸⁴ Thus, the evidence presented by Intervenor's refutes NRC Staff's position that "[i]t is inappropriate to use EPA drinking water standards to characterize onsite groundwater contamination level."⁸⁵ To the contrary, it is of no moment that the groundwater at Indian Point is not used for potable water; for purposes of an adequate analysis pursuant to NEPA, whether or not the radionuclide levels in the groundwater exceed EPA's standards remains relevant. In particular, exceedences over these levels tend to indicate that the impact to the groundwater at Indian Point is *not* "SMALL."

Notably, the data that Entergy has made available since Intervenor's initial hearing submissions also shows that radionuclide concentrations in the groundwater, have *continued to exceed* EPA drinking water levels:

⁸² See Intervenor's Statement of Position at 51-52; Gundersen Testimony at 19-21.

⁸³ See Intervenor's Statement of Position at 51-52; Gundersen Testimony at 19-21. While Intervenor's intended to include this most recent data from the second sampling quarter of 2011 as RIV000090, Intervenor's inadvertently submitted data from a different sampling quarter (the third quarter of 2010). As such, Riverkeeper herewith submits revised hearing exhibit RIVR000090, which constitutes the referenced data from Q2 of 2011.

⁸⁴ See Intervenor's Statement of Position at 54-55; Gundersen Testimony at 19-20.

⁸⁵ NRC Staff's Statement of Position at 67; Intervenor's Statement of Position at 54-55; Gundersen Testimony at 19-20.

2011 Q3 Monitoring Well Data – Levels Detected over EPA MCLs⁸⁶			
Monitoring Location	Radionuclide Detected	EPA Limit	Level(s) Detected
MW-42-49	Cesium-137	200 pCi/l	11,700 pCi/l
MW-42-49	Cesium-137	200 pCi/l	15,700 pCi/l
U1-NCD	Cesium-137	200 pCi/l	4,770 pCi/l
MH-5	Tritium	20,000 pCi/l	27,400 pCi/l
MH-5	Tritium	20,000 pCi/l	20,900 pCi/l
MH-5	Tritium	20,000 pCi/l	33,700 pCi/l
MW-30-69	Tritium	20,000 pCi/l	119,000 pCi/l
MW-30-69	Tritium	20,000 pCi/l	114,000 pCi/l
MW-32-59	Tritium	20,000 pCi/l	20,600 pCi/l
MW-45-42	Tritium	20,000 pCi/l	39,400 pCi/l
MW-45-42	Tritium	20,000 pCi/l	27,200 pCi/l
MW-47-80	Tritium	20,000 pCi/l	136,000 pCi/l
MW-47-80	Tritium	20,000 pCi/l	137,000 pCi/l
MW-54-37	Tritium	20,000 pCi/l	27,900 pCi/l
MW-54-37	Tritium	20,000 pCi/l	31,300 pCi/l
MW-56-83	Tritium	20,000 pCi/l	84,200 pCi/l
MW-56-83	Tritium	20,000 pCi/l	105,000 pCi/l
MW-57-20	Tritium	20,000 pCi/l	38,100 pCi/l
MW-57-20	Tritium	20,000 pCi/l	24,700 pCi/l
MW-57-45	Tritium	20,000 pCi/l	25,300 pCi/l
MW-57-45	Tritium	20,000 pCi/l	24,600 pCi/l
MW-42-49	Nickel-63	50 pCi/l	167 pCi/l
MW-42-49	Nickel-63	50 pCi/l	280 pCi/l
U1-NCD	Nickel-63	50 pCi/l	114 pCi/l
MW-37-32	Strontium-90	8 pCi/l	16.8 pCi/l
MW-37-40	Strontium-90	8 pCi/l	19.5 pCi/l
MW-37-57	Strontium-90	8 pCi/l	21.5 pCi/l
MW-49-26	Strontium-90	8 pCi/l	12.6 pCi/l
MW-49-42	Strontium-90	8 pCi/l	16.1 pCi/l
MW-49-65	Strontium-90	8 pCi/l	11.4 pCi/l
MW-50-42	Strontium-90	8 pCi/l	9.47 pCi/l
MW-50-66	Strontium-90	8 pCi/l	26.1 pCi/l
MW-50-66	Strontium-90	8 pCi/l	25.7 pCi/l
MW-53-120	Strontium-90	8 pCi/l	33 pCi/l
MW-54-144	Strontium-90	8 pCi/l	11.3 pCi/l
MW-54-144	Strontium-90	8 pCi/l	11 pCi/l
MW-54-190	Strontium-90	8 pCi/l	17.5 pCi/l
MW-54-190	Strontium-90	8 pCi/l	18.9 pCi/l
MW-55-24	Strontium-90	8 pCi/l	12.9 pCi/l
MW-55-35	Strontium-90	8 pCi/l	16.3 pCi/l

⁸⁶ Entergy Groundwater Well Data, Quarter 3, 2011, IPEC00239720 (Exhibit RIV000121).

MW-55-54	Strontium-90	8 pCi/l	22 pCi/l
MW-57-11	Strontium-90	8 pCi/l	38.7 pCi/l
MW-57-11	Strontium-90	8 pCi/l	20.8 pCi/l
MW-66-36	Strontium-90	8 pCi/l	8 pCi/l
U1-NCD	Strontium-90	8 pCi/l	90.8 pCi/l

2011 Q4 Monitoring Well Data – Levels Detected over EPA MCLs⁸⁷			
Monitoring Location	Radionuclide Detected	EPA Limit	Level(s) Detected
MW-42-49	Cesium-137	200 pCi/l	3,030 pCi/l
U1-NCD	Cesium-137	200 pCi/l	5,920 pCi/l
U1-NCD	Cesium-137	200 pCi/l	7,730 pCi/l
MH-5	Tritium	20,000 pCi/l	24,000 pCi/l
MW-30-69	Tritium	20,000 pCi/l	91,200 pCi/l
MW-32-59	Tritium	20,000 pCi/l	29,100 pCi/l
MW-47-80	Tritium	20,000 pCi/l	96,800 pCi/l
MW-56-83	Tritium	20,000 pCi/l	72,500 pCi/l
MW-42-49	Nickel-63	50 pCi/l	57.7 pCi/l
U1-NCD	Nickel-63	50 pCi/l	136 pCi/l
U1-NCD	Nickel-63	50 pCi/l	196 pCi/l
MW-37-22	Strontium-90	8 pCi/l	8.02 pCi/l
MW-37-32	Strontium-90	8 pCi/l	12.6 pCi/l
MW-37-40	Strontium-90	8 pCi/l	15 pCi/l
MW-37-57	Strontium-90	8 pCi/l	18.8 pCi/l
MW-49-26	Strontium-90	8 pCi/l	12.7 pCi/l
MW-49-42	Strontium-90	8 pCi/l	21.1 pCi/l
MW-49-65	Strontium-90	8 pCi/l	20.2 pCi/l
MW-50-42	Strontium-90	8 pCi/l	30.2 pCi/l
MW-50-66	Strontium-90	8 pCi/l	26.6 pCi/l
MW-53-120	Strontium-90	8 pCi/l	40.5 pCi/l
MW-54-144	Strontium-90	8 pCi/l	9.05 pCi/l
MW-54-190	Strontium-90	8 pCi/l	18.1 pCi/l
MW-55-24	Strontium-90	8 pCi/l	23.3 pCi/l
MW-55-35	Strontium-90	8 pCi/l	23.5 pCi/l
MW-55-54	Strontium-90	8 pCi/l	17.5 pCi/l
MW-66-36	Strontium-90	8 pCi/l	10.2 pCi/l
MW-67-39	Strontium-90	8 pCi/l	13 pCi/l
U1-NCD	Strontium-90	8 pCi/l	15.8 pCi/l
U1-NCD	Strontium-90	8 pCi/l	14.9 pCi/l

⁸⁷ Entergy Groundwater Well Data, Quarter 4, 2011, IPEC00257769 (Exhibit RIV000122).

2012 Q1 Monitoring Well Data – Levels Detected over EPA MCLs⁸⁸			
Monitoring Location	Radionuclide Detected	EPA Limit	Level(s) Detected
MW-42-49	Cesium-137	200 pCi/l	12,200
MW-30-69	Tritium	20,000 pCi/l	86,900
MW-47-80	Tritium	20,000 pCi/l	42,700
MW-56-83	Tritium	20,000 pCi/l	34,500
MW-42-49	Nickel-63	50 pCi/l	176
MW-37-32	Strontium-90	8 pCi/l	8.98
MW-37-40	Strontium-90	8 pCi/l	15.2
MW-37-57	Strontium-90	8 pCi/l	16.4
MW-42-49	Strontium-90	8 pCi/l	14.9
MW-49-26	Strontium-90	8 pCi/l	10.2
MW-49-42	Strontium-90	8 pCi/l	13.4
MW-49-65	Strontium-90	8 pCi/l	11
MW-50-66	Strontium-90	8 pCi/l	17.2
MW-53-120	Strontium-90	8 pCi/l	33.7
MW-55-24	Strontium-90	8 pCi/l	11.1
MW-55-35	Strontium-90	8 pCi/l	18.8
MW-55-54	Strontium-90	8 pCi/l	12.7
MW-66-36	Strontium-90	8 pCi/l	8.88
MW-67-39	Strontium-90	8 pCi/l	9.85

Based on Entergy's own data, it remains unclear that the plumes are *actually* decreasing as Entergy and NRC Staff claim.⁸⁹ As discussed in Intervenor's initial hearing submissions, the plumes will remain high even if no additional radiological leaks occur.⁹⁰ Furthermore, additional radiological leaks at Indian Point will indisputably lead to increases in the contamination plumes, resulting in a plume that will likely remain at high levels, including those in excess of EPA standards.⁹¹ Indeed, the inevitable result of any additional future leaks, whether they are from SFPs or other components, is that such leaks will comeingle and coalesce with the contamination that exists in the groundwater due to SFP leaks, resulting in a cumulative

⁸⁸ Entergy Groundwater Well Data, Quarter 1, 2012, (Exhibit RIV000123).

⁸⁹ See Gundersen Testimony at 21

⁹⁰ *Id.* at 19-21; *see also* Entergy's Statement of Position at 30 (discussing "localized fluctuations" in plume activity to be expected); Entergy's Testimony at A99.

⁹¹ See Gundersen Testimony at 15-16, 19-21.

impact. Thus, NRC Staff's assertions that "[t]here is no evidence that groundwater contamination at the site will grow over time" and that, instead "the evidence indicates that groundwater concentrations at the site are decreasing,"⁹² are simply unfounded. Overall, the trend in the data squarely demonstrates that impact of the contamination in the groundwater at Indian Point from past leaks, as well as likely future leaks, cannot unequivocally be characterized as "SMALL."

Entergy and NRC Staff both also take the position that Entergy's network of monitoring wells are "sufficient to allow Entergy to detect comparable future releases to groundwater at the site,"⁹³ and that this somehow justifies a finding that the impact of the radiological contamination on groundwater quality is "SMALL."⁹⁴ This position is unfounded for several reasons. First, this position is contrary to Entergy's various admissions that its network of monitoring wells will *not* be able to detect all future releases.⁹⁵ Moreover, to the extent Entergy's monitoring wells will detect future leaks, this does not *prevent* an impact to the groundwater; in fact, Entergy's and NRC Staff's position precisely highlights the fact that impacts to the quality of the groundwater will certainly continue, since Entergy chooses to rely on after-the-fact detection of radiological leaks.⁹⁶ For example, NRC Staff explicitly indicates

⁹² NRC Staff's Statement of Position at 71.

⁹³ Entergy's Statement of Position at 43; Entergy's Testimony at A137; *see id.* at A101; NRC Staff Statement of Position at 34, 41, 63, 66.

⁹⁴ Entergy's Statement of Position at 43; Entergy's Testimony at A137; *see id.* at A101.

⁹⁵ *See* Gundersen Testimony at 9-10, 12; Intervenor's Statement of Position at 33-37; In the Matter of Entergy Nuclear Indian Point 2, LLC, and Entergy Nuclear Indian Point 3, LLC, and Entergy Nuclear Operations Inc's Joint Application for CWA § 401 Water Quality Certification, Prefiled Testimony of Matthew J. Barvenik, Issue for Adjudication No. 3 – Radiological Materials (July 22, 2011), at 11 ("Barvenik CWA § 401 Proceeding Testimony") (Exhibit RIV000071); GZA, GeoEnvironmental, Inc. Final IPEC Quarterly Long-Term Groundwater Monitoring Report, Quarter Two 2010 (Report No. 10) (February 15, 2011), IPEC00227561, at pg.1-3, footnote 6 (Exhibit RIV000076).

⁹⁶ *See* Gundersen Testimony at 9-11; *see* Intervenor's Initial Statement of Position at 33-37.

that “the detection of leaks from the Unit 2 SFP relies on groundwater well monitoring.”⁹⁷ Thus, based on Entergy and NRC Staff’s own position and testimony, any future radiological leaks at Indian Point will undoubtedly add to the existing contamination, resulting in an ongoing cumulative impact.

Entergy goes on to dispute Intervenor’s well-founded position that neither Entergy nor NRC Staff have adequately assessed the groundwater contamination at Indian Point in terms of “[t]he degree to which the effects on the quality of the human environment are likely to be highly controversial,” or the extent to which the proposed action “threatens a violation of Federal, State, or local law or requirements,”⁹⁸ as dictated by NEPA implementing regulations.⁹⁹

First, Entergy alleges that the radiological contamination at Indian Point is “Not Controversial” and that Intervenor’s have allegedly equated “controversy” with public opposition to Indian Point.¹⁰⁰ However, public perception about the leaks at Indian Point has undoubtedly related to the degree of environmental harm posed by the leaks, and not simply to general public opposition to the operation of the plant.¹⁰¹ Thus, the discussion of the controversial nature of the radiological contamination at Indian Point in light of the poor public perception about such leaks was clearly valid and relevant. Moreover, the actual environmental impacts from SFP leaks are, in and of themselves, highly controversial. As evidenced by Intervenor’s initial filings, the SFP leaks and radiological contamination at Indian Point involve highly toxic radionuclides, persistent contamination plumes, and a litany of actual and potential future impacts to

⁹⁷ NRC Staff’s Statement of Position at 40.

⁹⁸ See Entergy’s Statement of Position at 43-44; see Intervenor’s Initial Statement of Position at 50, 56-57.

⁹⁹ See 40 C.F.R. § 1508.27(b)(4), (10).

¹⁰⁰ See Entergy’s Statement of Position at 44.

¹⁰¹ See *Hanly v. Kleindienst*, 471 F.2d 823, 830 (2d Cir. 1972) (explaining that “[t]he term ‘controversial’ apparently refers to cases where a substantial dispute exists as to the size, nature or effect of the major federal action rather than to the existence of opposition to a use”).

groundwater and the Hudson River.¹⁰² Thus, there is clearly a high degree of controversy surrounding this issue. Entergy's claim that the leaks and contamination result in "no adverse environmental impacts" remains disputed, and is not dispositive of whether the leaks and contamination are controversial. In sum, the degree of controversy surrounding the actual impacts posed by the leaks and contamination (and not merely "public opposition" to Indian Point generally) must play a role in the determination about the environmental significance of the SFP leaks at the plant.¹⁰³

Entergy further takes the position that the SFP leaks and groundwater contamination at Indian Point do not violate New York State water quality standards. In particular, Entergy claims that Intervenor's discussion of whether the groundwater at Indian Point meets NYS's potable water standard is not relevant because the groundwater is not used for such purposes.¹⁰⁴ NRC Staff takes a related position that "reference to the maximum concentration levels (MCLs) in EPA's drinking water standards . . . is not appropriate, since there is no onsite drinking water use or drinking water source."¹⁰⁵

However, Entergy and NRC Staff improperly ignore applicable state law, which pertains to the "best use" of the groundwater, notwithstanding whether or not the water is *actually used* for such purposes.¹⁰⁶ In that regard, as explained previously, violations of the standards, and likely future violations of the standards, are apparent: the data discussed in Intervenor's initial submissions as well as above, unquestionably demonstrate the groundwater under Indian Point is not "usable" for drinking as a result of Indian Point's discharges of radioactive materials;

¹⁰² See Gundersen Testimony at 19; see Intervenor's Initial Statement of Position at 56-57.

¹⁰³ 40 C.F.R. § 1508.27(b)(4).

¹⁰⁴ See Entergy's Statement of Position at 45; Entergy Testimony at A143.

¹⁰⁵ NRC Staff's Statement of Position at 65.

¹⁰⁶ See Intervenor's Initial Statement of Position at 55-56.

Entergy's own monitoring data shows consistent exceedences of EPA's maximum contaminant values. Thus, Entergy and NRC Staff have failed to demonstrate that Indian Point is currently operating in compliance with the New York State's designated best use standard applicable to groundwater at the plant.

Moreover, Entergy and NRC Staff have similarly failed to refute Intervenor's discussion about Entergy's failure to comply with NYS's prohibition against discharges of "high-level radioactive waste."¹⁰⁷ While NRC Staff fails to address this issue at all, Entergy fails to properly understand the applicability of the relevant State standards. To clarify: the spent fuel at Indian Point, to which Entergy attributes the majority of the groundwater contamination,¹⁰⁸ housed in the SFPs classifies as "high-level radioactive waste."¹⁰⁹; thus, the radionuclides that are discharged into the groundwater and/or into the Hudson River from these accidental leaks, emanate directly from high-level radioactive waste. This kind of release is necessarily encompassed by the State's prohibition contained in NYS ECL § 17-0807(1), (4). The remnants of the high-level radioactive waste stored at Indian Point will continue to discharge to the waters of NYS throughout the proposed relicensing term (both due to ongoing releases of radionuclides attributable to SFP leaks into the Hudson River, as well as because of ongoing and likely future leaks from the Unit 2 SFP to the groundwater and Hudson River), in clear violation of the relevant State standard.

Thus, the radiological leaks and groundwater contamination at Indian Point result in clear violations of NYS water quality standards. Such inconsistencies with State standards must

¹⁰⁷ Entergy's Statement of Position at 45-46.

¹⁰⁸ See Entergy Statement of Position at 30; Entergy's Testimony at A97, A100.

¹⁰⁹ See 10 CFR § 60.2 (defining High-Level Radioactive Waste as "(1) Irradiated reactor fuel, (2) liquid wastes resulting from the operation of the first cycle solvent extraction system, or equivalent, and the concentrated wastes from subsequent extraction cycles, or equivalent, in a facility for reprocessing irradiated reactor fuel, and (3) solids into which such liquid wastes have been converted.).

undoubtedly be considered pursuant to NEPA, in determining the significance of the SFP leaks and contamination at Indian Point.¹¹⁰

III. Entergy and NRC Staff have Failed to Demonstrate that Aquatic Ecology Impacts Due to SFP and Groundwater Contamination at Indian Point are “SMALL” or Have Been Adequately Considered

NRC Staff fails to meaningfully address Intervenor’s numerous concerns related to the impact of SFP leaks and radiological contamination at Indian Point on the aquatic ecosystem of the Hudson River. Instead, NRC Staff relies entirely on dose and monitoring assessments, performed pursuant to NRC’s narrow dose and monitoring requirements, to conclude that its environmental review of the leaks and contamination was sufficient.¹¹¹ That is, NRC Staff is satisfied with its assessment that the impact of SFP leaks and radiological contamination are not significant due to the NRC Staff’s estimation that the leaks and contamination have complied with such dose and monitoring requirements. With such a narrow focus, NRC Staff has failed to perform an adequate assessment pursuant to NEPA, and failed to demonstrate that impacts to aquatic ecology are not significant, or will not occur during the proposed period of extended operation, especially in light of the various issues raised in Intervenor’s initial hearing submission.¹¹²

Entergy claims that the impact of SFP leaks and radiological contamination at Indian Point on the aquatic ecosystem of the Hudson River is “SMALL.”¹¹³ Entergy’s position is likewise not dispositive. Entergy purports to affirmatively demonstrate that the leaks and resulting contamination have had no effect on the Hudson River and do not cause any

¹¹⁰ 40 C.F.R. § 1508.27(b)(10); Gundersen Testimony at 55-57.

¹¹¹ See NRC Staff’s Statement of Position at 23-24, 31-32.

¹¹² See Intervenor’s Initial Statement of Position at § Discussion II.B.v.

¹¹³ Entergy’s Statement of Position at 46; Entergy’s Testimony at A36, A137, A141, A142.

ecologically significant impacts.¹¹⁴ However, the evidence presented in Intervenor's initial hearing submissions calls these conclusions into question, due to Entergy's and NRC Staff's failure to adequately consider the potential impact of leaks in the future, throughout the proposed period of extended operation for Indian Point.¹¹⁵

Entergy relies heavily upon past and/or current assessments related to whether radionuclides from Indian Point have impacted aquatic organisms in the river.¹¹⁶ Moreover, Entergy does not dispute that it has no plan to undertake regular *enhanced* fish monitoring or otherwise engage in concerted efforts to determine whether radiological leaks may be impacting the aquatic resource of the river during the proposed relicensing term.¹¹⁷ Thus, in light of the facts that the radionuclides attributable to accidental leaks at Indian Point bioaccumulate in the environment, have been releasing to the Hudson River for years, are currently discharging to the river, and will continue to leach into the river throughout the entire proposed relicensing term,¹¹⁸ it simply cannot be said that Entergy has demonstrated that there will be no impact to the aquatic ecosystem *in the future*, i.e., during the proposed extension period. This is especially true given the proximity of Indian Point to Haverstraw Bay, a critical and significant habitat for many important fish species that reside in the Hudson River.¹¹⁹ Thus, Entergy's discussion of past and current assessments is not dispositive, and the concerns raised by Intervenor remain valid.¹²⁰

¹¹⁴ Entergy's Statement of Position at 46; Entergy's Testimony at A36, A137, A141, A142.

¹¹⁵ See Intervenor's Initial Statement of Position at § Discussion II.B.v.

¹¹⁶ Entergy's Statement of Position at 46-49.

¹¹⁷ See *id.* at 56-57.

¹¹⁸ See Gundersen Testimony at 12, 22-24; see also NRC Statement of Position at 69 (indicating that Strontium-90 will persist in the environment and thereby potentially release to the environment for at least 50 years, that is, for at least the entire proposed extended operating terms for Indian Point Units 2 and 3).

¹¹⁹ NYS Department of State, Division of Coastal Resources, Coastal Fish & Wildlife Habitat Rating Form, Haverstraw Bay (Exhibit RIV000092).

¹²⁰ See Intervenor's Initial Statement of Position at § Discussion II.B.v.

For example, Entergy has failed to sufficiently refute Intervenor's position that neither Entergy nor NRC Staff adequately considered the potential impact of the leaks and groundwater contamination on endangered resources in the Hudson River.¹²¹ In fact, since the filing of Intervenor's initial hearing submissions on RK-EC-3/CW-EC-1, the National Marine Fisheries Service ("NMFS") listed Atlantic sturgeon as "endangered" under the Endangered Species Act.¹²² NMFS explains that this prehistoric, critical species is in "precipitous decline" and "in danger of extinction" in the New York Bight distinct population segment, which includes the Hudson River.¹²³ NMFS indicates that threats to Atlantic sturgeon, including water quality degradation from industrial activities, "will continue to prevent population recovery."¹²⁴ This highlights the clear need for a full assessment of the impacts of radiological contamination from Indian Point on Atlantic sturgeon *throughout* the proposed relicensing term. Yet, neither Entergy nor NRC Staff have done such an evaluation.¹²⁵ Thus, this new information further supports Intervenor's position that Entergy and NRC Staff's environmental assessments of the impact of SFP leaks at Indian Point are deficient for failing to consider potential impacts *over the entire proposed 20-year relicensing term* to the (now endangered) Atlantic sturgeon.¹²⁶

Furthermore, in attempting to refute Intervenor's position regarding the insufficiency of Entergy and NRC Staff's review of the impact of the radiological contamination at Indian Point

¹²¹ See *id.* at 62.

¹²² See National Oceanic and Atmospheric Administration, 50 CFR Parts 223 and 224, RIN 0648-XJ00 [Docket No. 100903414-1762-02], Endangered and Threatened Wildlife and Plants; Threatened and Endangered Status for Distinct Population Segments of Atlantic Sturgeon in the Northeast Region, National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce, Final rule, 77 Fed. Reg. 5880 (Feb. 6, 2012).

¹²³ See NOAA Fact Sheet, Atlantic Sturgeon New York Bight Distinct Population Segment: Endangered (RIV000124).

¹²⁴ *Id.*

¹²⁵ See *id.* at 62.

¹²⁶ 40 C.F.R. § 1508.27(b)(9).

on the aquatic ecology of the Hudson River, Entergy points to the alleged results of a Riverkeeper study of Hudson River shellfish and sediment.¹²⁷ However, Entergy's reliance on this study to demonstrate that there will be no long-term environmental impacts from the Indian Point SFP leaks is unfounded. In particular, while the initial aspirational goal of the Riverkeeper study was to determine whether the radiological contamination at Indian Point would result in long-term environmental impacts, the reality is that the study was never completed, and this goal was never attained.¹²⁸ Entergy's witnesses' characterization that "[n]o final report of this sampling was made available to Entergy"¹²⁹ is somewhat misleading, since, in fact, no such "final report" exists.¹³⁰ Since Riverkeeper's very limited study from 2007, i.e. 5 years ago, resulted in a small amount of data that was limited in scope and time, the results are clearly not dispositive of whether impacts to aquatic ecology are likely to occur and/or manifest in the future, during the proposed period of extended operation, which is the relevant inquiry.¹³¹

IV. Entergy Mischaracterizes the Significance of IP1 SFP Leaks and Entergy and NRC Staff have Failed to Demonstrate that IP1 SFP Leaks Have Been Adequately Considered

Entergy's position with respect to Indian Point Unit 1 SFP leaks is misleading on several counts. First, Entergy once again resurrects the completely baseless argument that IP1 SFP leaks are not related to the license renewal of Indian Point Units 2 and 3, and that these leaks do not require evaluation.¹³² To support this position, Entergy again alleges that there is no nexus between the license renewal of Indian Point Units 2 and 3 and the future decommissioning of

¹²⁷ Entergy's Statement of Position at 47; ENT000367; Entergy's Testimony at A117.

¹²⁸ See Declaration of Phillip Musegaas (July 13, 2012) (RIV000125).

¹²⁹ Entergy's Testimony at A117.

¹³⁰ See Declaration of Phillip Musegaas (July 13, 2012) (RIV000125).

¹³¹ See *id.*

¹³² Entergy's Statement of Position at 50.

Indian Point Unit 1, and that the Indian Point Unit 1 pools were “emptied and drained in December 2008.” Notably Entergy’s previous attempts to characterize the Unit 1 SFP leaks and contamination resulting therefrom as irrelevant have not been successful.¹³³ Indeed, the leaks that have occurred from the Unit 1 spent fuel pools are squarely within the scope of Consolidated Contention RK-EC-3/CW-EC-1, and must be fully and adequately assessed in order for NRC Staff to comply with NEPA.

Intervenors’ reference to decommissioning simply reveals how the legacy contamination attributable to the Indian Point Unit 1 spent fuel pool will continue to impact the environment *during the license renewal process*. Therefore, contrary to Entergy’s position, there is absolutely a “nexus” between license renewal of Units 2 and 3, and the decommissioning of Unit 1: as long as Units 2 and 3 continue to operate, the contamination from Unit 1 will continue to release to the groundwater and have an impact on the environment.

Moreover, Entergy is mistaken in its position that simply because the Indian Point Unit 1 spent fuel pools have been drained that the past radiological leaks are no longer a concern. As Mr. Gundersen’s testimony indicates, the residual contamination is found in subsurface structures, and will continue to periodically release radionuclides to the groundwater *throughout* the license renewal period.¹³⁴ Entergy’s own site investigation report clearly acknowledges this fact:

¹³³ For example, despite Entergy’s identical argument in response to Riverkeeper’s originally proffered contention, the ASLB did not limit the scope of the contention to exclude leaks from IP Unit 1. *See, e.g.*, Answer of Entergy Nuclear Operations, Inc. Opposing Riverkeeper Inc.’s Request for Hearing and Petition to Intervene, January 22, 2008, at 149, ADAMS Accession No. ML080300071 (“IP1-SFP leak is clearly beyond the scope of this license renewal proceeding”); ASLB July 31, 2008 Contention Admissibility Order at 187-88, 192. Entergy then made this same failing argument in a Motion for Reconsideration of the ASLB’s admission of Riverkeeper’s contention, in an interlocutory appeal to the Commission, and in its Motion *in Limine* seeking to strike the testimony of Intervenors’ expert, all to no avail.

¹³⁴ *See* Gundersen Testimony at 12; In the Matter of Entergy Nuclear Indian Point 2, LLC, and Entergy Nuclear Indian Point 3, LLC, and Entergy Nuclear Operations Inc.’s Joint Application for CWA § 401 Water Quality Certification, Combined Prefiled Rebuttal Testimony of Thomas C. Esselman, Ph.D., Matthew J. Barvenik, and

[f]rom a contaminant plume perspective, these historic releases [those from the Unit 1 SFPs] still represent an ongoing legacy source of strontium in the groundwater to the south side of Unit 1. This is because strontium partitions from the water phase and adsorbs to solid materials, including subsurface soil and bedrock. The strontium previously adsorbed to these subsurface materials then partitions back to and continues to contaminate the groundwater over time, even after the storm drain releases have been terminated.¹³⁵

Moreover, Entergy's own witness, Matthew Barvenik, in a different proceeding concerning the radiological leaks at Indian Point, recognized that as a result of partitioning, the strontium and cesium "that's leaked from the Unit 1 spent-fuel pool that's been retained in the subsurface would continue to be released to the groundwater in the future" and that such partitioning is expected to "continue *at least* into the renewal period."¹³⁶ Thus, Entergy's position that "the IP1 SFPs are no longer an active source of radionuclides to the subsurface" is misleading and inaccurate.¹³⁷ In this regard, NRC Staff even acknowledges that the Unit 1 SFP leaks have resulted in residual contamination that poses the potential for future releases to the groundwater.¹³⁸

Thus, even though Unit 1 is not the subject of the license renewal proceeding, because it will continue to exist without being dismantled and the site will not be remediated, leaks attributable to Unit 1 are highly relevant to the relevant NEPA inquiry. The radionuclides leaked

Owen Hoffman, Ph.D., Radiological – Issue for Adjudication No. 3 (October 4, 2011), at 23 ("Barvenik CWA § 401 Proceeding Rebuttal Testimony") (Exhibit RIV000099).

¹³⁵ GZA, GeoEnvironmental, Inc., Site Investigation Report (January 11, 2008) (ENT00331B) at 113.

¹³⁶ In the Matter of: Entergy Nuclear Indian Point 2, LLC, and Entergy Indian Point 3, LLC, For a State Pollution Discharge Elimination System Permit Renewal and Modification, DEC No.: 3-5522-00011/00004, SPDES No.: NY-0004472; Entergy Nuclear Indian Point 2, LLC, Entergy Nuclear Indian Point 3, LLC, and Entergy Nuclear Operations, Inc. Joint Application for CWA § 401 Water Quality Certification, DEC App. Nos. 3-5522-00011/00030 (IP2), 3-5522-00105/00031, Transcript of Arbitration before Daniel P. O'Connell, ALJ, Maria E. Villa, ALJ, Reporter: Alan H. Brock, RDR, CRR, Farmer Arsenault Brock LLC (January 23, 2012, pages 3895-4125), at 3974-3977:1-12 (RIV000126) (hereinafter "CWA § 401 WQC Hearing Transcript Excerpt").

¹³⁷ See Entergy's Statement of Position at 26; Entergy's Testimony at A66.

¹³⁸ NRC Staff's Statement of Position at 66.

from the Unit 1 SFPs cause cumulative impacts when combined with leaks from the Unit 2 pools and other components. Such impacts must be assessed in order to determine the “significance” of the spent fuel pool leaks at Indian Point.¹³⁹

Furthermore, Entergy’s position that “nevertheless,” the IP1 SFP leaks have been assessed, and that the toxic contamination plume resulting from these leaks has no “material impact,” is unpersuasive. For example, though Entergy points to a drain collection system that allegedly “captures a large majority of the residual IP1 contamination,”¹⁴⁰ Entergy fails to indicate that any such radioactive water that is “picked up” in the NCD and treated, still eventually discharges to the Hudson River by way of the Indian Point discharge canal, and still contains strontium, as well as other radionuclides, including tritium, which cannot be filtered.¹⁴¹ As radionuclides can partition to the NCD, and later unpartition, “i.e., come[] back off” and “move into the water in the drain,” partitioning results in periodic releases of Unit 1 SFP-related contamination captured by the NCD directly to the Hudson River.¹⁴² It remains unclear whether Entergy has adequately accounted for the ongoing release of Indian Point Unit 1 SFP leakage to the environment in this manner.

Similarly, NRC Staff have failed to demonstrate that the Unit 1 SFP leaks and residual contamination at the Indian Point site have been adequately assessed. NRC Staff merely asserts that because the Unit 1 SFPs have “been drained” and because this circumstance has resulted in “the effective termination of that source of contamination,” that there is “no reason to expect that any significant groundwater contamination will occur as a result of license renewal of Indian

¹³⁹ See ASLB July 31, 2008 Contention Admissibility Order at 188; *see id.* at 192; *Grand Canyon Trust v. FAA*, 290 F.3d 339, 345-46 (D.C. Cir. 2002); 40 C.F.R. § 1508.7.

¹⁴⁰ See Entergy’s Statement of Position at 51; Entergy’s Testimony at A38.

¹⁴¹ CWA § 401 WQC Hearing Transcript Excerpt at 3878-79, 4106-07, 4099-4100 (RIV000126).

¹⁴² *See id.*

Point Units 2 and 3.”¹⁴³ However, for the reasons discussed at length above and in Intervenor’s initial hearing submissions, this inquiry is improperly narrow, and NRC Staff’s conclusions remain unfounded.¹⁴⁴

In sum, as discussed in Intervenor’s initial hearing submissions, neither Entergy nor NRC Staff have adequately assessed the impact of the IP1 SFP leaks.¹⁴⁵ While Intervenor’s have put forth enough evidence to demonstrate that these leaks result in impacts that are “significant” for purposes of NEPA, Entergy and NRC Staff’s filings on the other hand fail to meaningfully demonstrate that the IP1 SFP will unequivocally cause no significant environmental impact.

V. Entergy and NRC Staff have Failed to Demonstrate that Future Radiological Leaks Have Been Adequately Considered, and the Conclusion that Environmental Impacts from SFP Leaks and Groundwater Contamination at Indian Point “Will Likely Remain SMALL” is Unfounded

Both Entergy and NRC Staff refute Intervenor’s position that current active leaks and likely future leaks from the Unit 2 SFP have not been adequately assessed.

Entergy purports to demonstrate that an adequate, “worst case” assessment of the Indian Point Unit 2 SFP leaks and the contamination resulting therefrom, has been done, and that any current IP2 SFP leaks do not cause a material environmental impact.¹⁴⁶ NRC Staff acknowledges that the Unit 2 SFP may currently be leaking approximately 30 gallons per day, but, like Entergy, does not believe such current leakage affects the contamination plumes at Indian Point, or that Unit 2 leaks result in an environmental impact.¹⁴⁷ However, Entergy and NRC Staff’s similar positions lack sufficient support in light of the testimony and arguments

¹⁴³ NRC Staff’s Initial Statement of Position at 67.

¹⁴⁴ Intervenor’s Initial Statement of Position at § Discussion II.B.ii.

¹⁴⁵ See *id.*; Gundersen Testimony at 12.

¹⁴⁶ See Entergy’s Statement of Position at 51-52; Entergy’s Testimony at A97.

¹⁴⁷ See NRC Staff’s Statement of Position at 40-42, 61-63, 65.

proffered by Intervenor. In particular, there is ample evidence to show that the Unit 2 SFP leaks have already caused an impact that is significant for purposes of a NEPA inquiry, and that ongoing leaks, whatever their size, continue to contribute to ongoing impacts.¹⁴⁸ Entergy's characterization that the Indian Point license renewal FSEIS evaluated the "worst case depiction of the IP2 SFP tritium plume"¹⁴⁹ and NRC Staff's characterization that any current leaks do not affect the tritium plume activity,¹⁵⁰ are at best misleading, due to evidence that the plume continues to fluctuate and exceed EPA maximum contaminant levels, and has experienced marked increases in light of new sources of SFP leakage, as Intervenor previously discussed.¹⁵¹ Entergy and NRC Staff's blanket conclusions that the IP2 SFP leaks cause "no impact" on health or the environment¹⁵² are simply incorrect, since it is based on an overly simplistic assessment that does not comply with the requirements of NEPA.

Entergy and NRC Staff further take the position that because Entergy has a groundwater monitoring program, which Entergy believes "has the ability to identify, characterize, and respond appropriately to any future radionuclide releases to the groundwater,"¹⁵³ that this supports a finding that the impact of the IP2 SFP leaks are "SMALL" or not significant. However, as discussed above, as well as in Intervenor's initial hearing submissions, this position is wrong.¹⁵⁴ Simply put, a reactive system to detect leaks *after they occur* does not prevent impacts to the groundwater and Hudson River. Thus, if new leaks are detected by Entergy's

¹⁴⁸ See Intervenor's Initial Statement of Position at §§ Discussion II.B.i, iv.

¹⁴⁹ See Entergy's Statement of Position at 51-52; Entergy's Testimony at A97.

¹⁵⁰ See NRC Staff's Statement of Position at 40-42, 61-63, 65.

¹⁵¹ See Intervenor's Initial Statement of Position at §§ Discussion II.B.i.

¹⁵² See Entergy's Statement of Position at 51-52; Entergy's Testimony at A97; NRC Staff's Statement of Position at 65.

¹⁵³ See Entergy's Statement of Position at 52; Entergy's Testimony at A102.

¹⁵⁴ See Intervenor's Initial Statement of Position at §§ Discussion II.B.i; Gundersen Testimony at 9-12.

groundwater monitoring system, the impact will have already occurred. It is far from clear that such prospective releases and future impacts will necessarily be “SMALL,” especially in light of evidence of a very recent *new* IP2 SFP leak that caused increases in tritium concentrations in the groundwater.¹⁵⁵

Lastly, both Entergy and NRC Staff take the position that future leaks from the Unit 2 SFP are unlikely because there are no aging mechanisms affecting the pool.¹⁵⁶ However, this is disputable in light of the testimony of Intervenor’s witness, Mr. Gundersen, relating to the “bathtub” aging of the pool that is expected to occur.¹⁵⁷ Far from a “generalized assertion,” Mr. Gundersen has provided an expert opinion based on his experience as a nuclear engineer as well as his review of Entergy’s own documentation concerning ongoing aging issues facing the Unit 2 SFP (which have repeatedly manifested over the course of decades in the discovery of leak paths from the pool to the environment); thus, Mr. Gundersen’s testimony that the Unit 2 SFP will face aging issues and/or likely leak in the future, is well founded. Notably, neither Entergy nor NRC Staff dispute that fact that a large portion of the Unit 2 SFP liner is inaccessible and has never been inspected.¹⁵⁸ Further, while Entergy and NRC Staff’s witnesses indicate that various tests have been performed on the IP2 pool, they neglect to mention that Entergy has no plans for *any* future inspections of the accessible or inaccessible portions of the IP2 SFP liner.¹⁵⁹ In relation to a plant component that has already experienced numerous leaks, has no drain collection system

¹⁵⁵ See Intervenor’s Initial Statement of Position at §§ Discussion II.B.i; Gundersen Testimony at 6-7, 10.

¹⁵⁶ See Entergy’s Statement of Position at 52-53; Entergy’s Testimony at A145, A71, A72, A73, A38; NRC Staff’s Statement of Position at 64.

¹⁵⁷ See Gundersen Testimony at 10-11.

¹⁵⁸ See Entergy’s Statement of Position at 53; Entergy’s Testimony at A72; NRC Staff’s Statement of Position at 40.

¹⁵⁹ See Intervenor’s Initial Statement of Position at §§ Discussion II.B.i; Gundersen Testimony at 6-12.

or other mechanism to *preventatively* detect leaks, it remains far from clear that future leaks that are significant for purposes of NEPA, will not occur.

Overall, Entergy and NRC Staff have failed to demonstrate that despite the likelihood of future IP2 SFP leaks (as well as future contributions to the groundwater from residual IP1 SFP contamination), environmental impacts from SFPs “will likely remain SMALL.” This position is simply untenable in light of ample evidence of ongoing, and likely future impacts. Notably, newly identified component leaks will also add to and commingle with the existing radionuclides in the groundwater from the SFP leaks,¹⁶⁰ which further refutes the position that environmental impacts from SFPs “will likely remain SMALL.” That is, since future leaks will coalesce with and add to existing contamination, it is questionable that Entergy and NRC Staff can confidently conclude that impacts will be “SMALL” throughout the entire proposed period of extended operations.

VI. Entergy and NRC Staff have Failed to Demonstrate that Mitigation Alternatives Relating to SFP Leaks and Radiological Contamination at Indian Point Have Been Adequately Considered

Entergy asserts that an assessment of mitigation alternatives relating to SFP leaks and groundwater contamination at Indian Point is not necessary because of an alleged “lack of environmental significance” of the leaks and contamination.¹⁶¹ However, for the reasons discussed at length in Intervenor’s initial hearing submissions, Entergy and NRC Staff’s finding that the impacts of the SFP leaks and groundwater contamination at Indian Point are “SMALL” is highly disputable and unfounded.¹⁶² The impacts posed by the leaks and resulting

¹⁶⁰ See Gundersen Testimony at 15.

¹⁶¹ Entergy’s Statement of Position at 54.

¹⁶² See Intervenor’s Initial Statement of Position at § Discussion II.B.

groundwater contamination are clearly not “minor,” and a discussion of mitigation alternatives is warranted and necessary.¹⁶³

Entergy’s further assertion that all of Intervenor’s “suggested ‘mitigation’ has already been considered or put in place”¹⁶⁴ is misleading and inaccurate. Indeed, Intervenor’s have undeniably demonstrated the various ways in which neither Entergy nor NRC staff have sufficiently considered various suggested mitigation measures.¹⁶⁵

To begin with, Entergy, as well as NRC Staff, claim that groundwater extraction was adequately considered but rejected due to the potential for contamination migration.¹⁶⁶ However, this position is belied by Entergy’s witness’ own admissions that extraction has long been, and continues to be feasible at Indian Point. This was fully explained in Intervenor’s initial hearing submissions.¹⁶⁷ Additional evidence generated after Intervenor’s initial filings further demonstrates the inaccurate nature of Entergy’s position relating to extraction at Indian Point. In particular, in a separate proceeding concerning the radiological leaks at Indian Point, Entergy’s witness, Matthew Barvenik, testified that extraction wells “could be effective” at extracting the radioactive elements from the groundwater and that multiple wells could be sited in varying locations including potentially directly over the strontium plume such that extraction would not shift the plume.¹⁶⁸ Thus, Entergy and NRC Staff’s apparent justification for deciding against extraction is unfounded. In any event, in light of the feasibility and efficacy of extraction wells

¹⁶³ See 40 C.F.R. § 1508.25(b)(3); 40 C.F.R. §§ 1508.20; *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 351-52 (1989).

¹⁶⁴ See Entergy’s Statement of Position at 54.

¹⁶⁵ See Intervenor’s Initial Statement of Position at § Discussion II.B.vi; Gundersen Testimony at 25-29.

¹⁶⁶ Entergy’s Statement of Position at 55 (citing NRC May 13, 2008 Inspection Report, Enclosure at 13); Entergy’s Testimony at A155; NRC Staff’s Statement of Position at 72-73.

¹⁶⁷ See Intervenor’s Initial Statement of Position at § Discussion II.B.vi; Gundersen Testimony at 25-29.

¹⁶⁸ CWA § 401 WQC Hearing Transcript Excerpt at 4041, 4092, 4094-95 (RIV000126).

at Indian Point, this mitigation alternative should have been fully assessed during the NEPA review process.¹⁶⁹ The stark absence of any consideration of extraction wells leaves Entergy and NRC Staff's assessments glaringly deficient.

Next, Entergy claims that it has already performed activities relating to preventatively detecting leaks from the Unit 2 SFP at Indian Point.¹⁷⁰ However, Entergy and Entergy's witnesses merely point to the one-time inspection of the only a portion of the SFP liner and an assertion that there are no aging mechanisms occurring in the SFP.¹⁷¹ For the reasons discussed at length in Intervenor's initial hearing submissions, as well as above, Entergy has failed to show that future leaks from the Unit 2 SFP will be preventatively detected.¹⁷² NRC Staff position explanation that "the detection of leaks from the Unit 2 SFP relies on groundwater well monitoring"¹⁷³ further supports this notion. Thus, an assessment of relevant mitigation alternatives with respect to this concern is, thus, amply warranted.

Entergy also claims that consideration of enhanced ecological monitoring is not necessary, however this is due to Entergy's position that the SFP leaks and groundwater contamination at Indian Point allegedly have "no adverse impacts to the Hudson River ecosystem."¹⁷⁴ As discussed above, Intervenor's have presented valid concerns relating to Entergy and NRC Staff's conclusions relating to the impact of radiological contamination at Indian Point on the aquatic ecology of the Hudson River *throughout the proposed period of*

¹⁶⁹ See Intervenor's Initial Statement of Position at § Discussion II.B.vi.

¹⁷⁰ Entergy's Statement of Position at 55-56; Entergy's Testimony at A72, A73, A145.

¹⁷¹ Entergy's Statement of Position at 55-56; Entergy's Testimony at A72, A73, A145.

¹⁷² See Intervenor's Initial Statement of Position at § Discussion II.B.i; Gundersen Testimony at 9-12.

¹⁷³ NRC Staff's Statement of Position at 40.

¹⁷⁴ Entergy's Statement of Position at 56-57; Entergy's Testimony at A36, A 141, A142, A137.

*extended operation.*¹⁷⁵ In light of potential future impacts to the river ecosystem, an assessment of the efficacy of enhanced river monitoring as a mitigation alternative was reasonable warranted.

Lastly, Entergy disputes Intervenor's suggestion that increased public access to information concerning radiological leaks and groundwater contamination at Indian Point should have been considered as a mitigation measure.¹⁷⁶ Contrary to Entergy's assertions, Intervenor provided a clear explanation of why such disclosure would qualify as a mitigation measure as contemplated under NEPA.¹⁷⁷ Of course, Entergy's position once again incorrectly hinges on its as-yet unfounded assertion that the impact of the SFP leaks and radiological contamination at Indian Point is "SMALL."¹⁷⁸ Furthermore, Entergy's explanation that it submits certain annual reports to NRC fails to address the suggestion raised by Intervenor about increased public disclosure of relevant information. That such annual disclosures are made "available" to the public by NRC in an obscure and less-than-simple-to-navigate database, does little to keep the public meaningfully informed about the status of the leaks and/or groundwater contamination, for example, in real-time, when new leaks occur. In light of the ability of targeted public disclosure to play a role in reducing the "significance" of the SFP leakage at Indian Point, this reasonable mitigation measure should have been fully assessed, but was not.

¹⁷⁵ See Intervenor's Initial Statement of Position at § Discussion II.B.v; Gundersen Testimony at 23-24.

¹⁷⁶ Entergy's Statement of Position at 57; Entergy's Testimony at 53.

¹⁷⁷ See Intervenor's Initial Statement of Position at 74 (explaining that an "assessment of the significance of an environmental impact includes the degree to which it is highly controversial. Since leaks at Indian Point were "discovered," there has been a high level of public concern, which continues today. This aspect of the leaks makes it "severe" as contemplated by NEPA's implementing regulations. Thus, measures to alleviate the public concern would assist in minimizing the overall impacts of the leaks.").

¹⁷⁸ See Entergy's Statement of Position at 57.

CONCLUSION

Based on the foregoing, as well as Intervenor's initial hearing submissions, Entergy's and NRC Staff's statements of position and witness testimony relating to RK-EC-3/CW-EC-1 fail to successfully refute the numerous deficiencies with Entergy and NRC Staff's NEPA-reviews of SFP leaks and radiological groundwater contamination at Indian Point, identified by Intervenor. The facts continue to demonstrate that the leaks and contamination at the plant have not been adequately assessed. Strong and substantial evidence demonstrates that Entergy and NRC Staff have failed to take the requisite "hard look" at the environmental impacts of spent fuel pool leaks and groundwater contamination at Indian Point. Accordingly, the ASLB should resolve Consolidated Contention RK-EC-3/CW-EC-1 in Intervenor's favor.

Respectfully submitted this 13th day of July 2012.

Signed (electronically) by Deborah Brancato

Deborah Brancato, Esq.
Phillip Musegaas, Esq.
Riverkeeper, Inc.
20 Secor Road
Ossining, NY 10562
(914) 478-4501
dbrancato@riverkeeper.org
phillip@riverkeeper.org