

**UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION**

**BEFORE THE ATOMIC SAFETY AND LICENSING BOARD**

Before Administrative Judges:

Lawrence G. McDade, Chairman  
Dr. Kaye D. Lathrop  
Dr. Richard E. Wardwell

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In the Matter of )

Docket Nos. 50-247-LR  
and  
50-286-LR

ENTERGY NUCLEAR OPERATIONS, INC. )

(Indian Point Nuclear Generating Units 2 and 3) )  
\_\_\_\_\_

Date: March 22, 2013

**POST-HEARING FINDINGS OF FACT AND CONCLUSIONS OF LAW SUPPORTING  
CONTENTION EC-3A REGARDING ENVIRONMENTAL JUSTICE**

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## **PRELIMINARY STATEMENT**

The Fukushima disaster has given rise to harrowing stories of severe hardship and fatalities among hospital patients, the elderly, and the sick. Hundreds died from chronic disease, lack of water or medications, extremes of temperature, or stress from the evacuation. The Katrina disaster and the aftermath of Hurricane Sandy also illustrated that when a major storm occurs the poor and minorities are least able to adapt and mitigate the consequences. These specific instances illustrate that the impacts from nuclear accidents tend to fall upon the most vulnerable, including Environmental Justice (“EJ”) populations. However, the Nuclear Regulatory Commission’s (“NRC”) EJ analysis for Indian Point failed to inform the agency or the public about these potentially significant disparate impacts. As a result, the agency failed to look at how such impacts could be mitigated.

Instead of using the more probing analysis used for at least one new reactor licensing, the NRC applied a cookie-cutter approach that has failed to identify disparate impact at Indian Point and at least 49 other reactors. This approach is flawed because it erroneously excluded impacts from nuclear accidents. Instead, the NRC compared existing impacts on EJ populations from normal operations to future impacts from the same operations. At the hearing stage, the NRC Staff did not study the impacts it had omitted. Instead, in response to proof of disparate impacts by Clearwater, the Staff arbitrarily dismissed them as insignificant. In short, the Staff failed to seriously consider how the most vulnerable can be affected by the realities of a nuclear accident. Both the National Environmental Policy Act, 42 U.S.C § 4321, et seq. (“NEPA”) and the NRC’s guidance on assessment of EJ impacts required the Staff to do a more thorough analysis.

With regard to the facts, the Staff and Entergy only dispute a few of the facts that Clearwater has established. A number of troubling facts have gone undisputed. For example,

those without their own transportation would have to wait at bus stops in the open air during an evacuation, even while the general population is either driving or sheltering-in-place. Even if the evacuation goes according to plan, institutionalized populations like prisoners could receive double the maximum allowable radiation dose for the general public. Furthermore, even though shelter-in-place is the primary mitigation approach, there has been no site-specific study of the suitability of buildings to shelter people, and few, if any buildings have filtered heating, ventilation and cooling systems. The main point of dispute is whether prisoners become agitated or docile during emergencies. On this point Clearwater presented credible testimony from an ex-prisoner, who discussed his own experiences, and a doctor and a sociologist both of whom discussed experiences from Hurricane Katrina, while NRC presented hearsay testimony from a prison official with unspecified qualifications. Experience and common sense shows that Clearwater is correct. Prisoners threatened by exposure to radiation are likely to become agitated and therefore prison evacuation will be more difficult than predicted by the Staff.

On the law, this Board and the Circuit courts have already found that NEPA requires the study of the mitigation of the consequences of severe accidents. Furthermore, the Commission excluded Environmental Justice (“EJ”) issues from the generic EIS. Instead, the regulations provide that EJ issues must be dealt with on a site-specific basis. *E.g.* NRC Staff Initial Statement of Position Regarding Contention CW-EC-3A (“NRC Staff SoP”) at 6. In turn the Commission has provided guidance on how such assessments must be carried out. *Id.* at 5. Prior to the hearing, Clearwater’s opening testimony and statement of position showed multiple failures of the Staff to carry out the Commission’s guidance. Initial Statement of Position for Clearwater’s Contention EC-3A Regarding Environmental Justice (“Clearwater SoP”) at 19-24. In response, the Staff incongruously tried to suggest it had followed the guidelines, but that it has

no need to look at site-specific EJ impacts of a severe accident either because the NRC has found generically that the impacts of severe accidents to be small, or because such issues raise concerns about emergency planning. NRC Staff SoP at 14-16. Entergy raised similar claims. Entergy's Statement of Position on Contention CW-EC-3A (Environmental Justice) ("Entergy SoP") at 17-19; 32-39.

We find that the Staff should have followed the NRC guidance on EJ analysis, but failed to do so. It should also have included consideration of the effects of severe accidents within this analysis. Had it done so, the evidence presented by Clearwater suggests there is a strong possibility that disparate impacts could result. These impacts cannot be dismissed as insignificant without considering all the factors that go into a decision about significance. More specifically, we believe that the acknowledged planned differences in radiation exposure for institutionalized populations have been written off as insignificant by the Staff without considering all the required factors, rendering this finding arbitrary. The significance of the difference in impact needs further study taking account of multiple factors, not just whether the impact will fall within relevant agency guidance.

Another flaw in the Staff's EJ analysis for the Final Supplemental Environmental Impact Assessment ("FSEIS") is that after it obtained the nominal locations of the EJ populations, it did nothing to determine whether there was anything unusual about those populations. See NRC Staff SoP at 12-13. This is despite specific Commission guidance requiring detailed assessment of the locations that result from the initial screening analysis. According to the Commission, that next step includes "considering factors peculiar to those communities." Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions ("NRC EJ Policy Statement"), 69 Fed. Reg. 52040, 52048 (August 24, 2004). For example, for the EJ

populations inside prisons, the peculiar factor is that the population is incarcerated. The analysis that Entergy presented in its hearing testimony shows that this factor would not have been hard to identify, had the Staff based its analysis on more detailed census data or had it done investigation of the area. Having failed to identify peculiar factors in the FSEIS, it is not surprising that the Staff concluded the impacts on the EJ populations would be the same as on the general population.

The purpose of the EJ assessment is to first assess the disparate impacts, determine their significance, and then examine feasible mitigation. Here, the Staff appears to have been blinded by its inability to conceive of any potential significant impacts that could result from the EJ assessment. It therefore went through the motions of applying a generic approach that simply attempted to identify the locations of the EJ populations, but nothing else. It then decided that because there is nothing special about those locations, there could be no disproportionate impact. This circular logic tells us nothing about EJ impacts, but much about the Staff's failure to comprehend its NEPA duties.

### **PROCEDURAL HISTORY**

In 2008, despite NRC and Entergy claims to the contrary, this Board agreed with Clearwater that a site-specific analysis of the impact on potentially affected EJ populations is required when it admitted Clearwater contention EC-3. *See Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3), LBP-08-13, 68 N.R.C. 43, 196-203 (July 31, 2008). We found that NEPA required a review of “environmental factors peculiar to minority or low-income populations that may cause them to suffer harm disproportionate to that suffered by the general population.” *Id.* at 199; *accord La. Energy Servs., L.P.* (Claiborne Enrichment Ctr.) (“Claiborne”), CLI-98-3, 47 N.R.C. 77, 100 (Apr. 3, 1998). In 2011, we again admitted a slightly amended contention regarding EJ populations that might be impacted by Entergy's

proposed actions. The amended contention stated, “Entergy’s environmental report and the Final Supplemental Environmental Impact Statement contain seriously flawed environmental justice analyses that do not adequately assess the impacts of relicensing Indian Point on the minority, low-income and disabled populations in the area surrounding Indian Point.” *Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3), ASLBP No. 07-858-03-LR-BD01, 60 (ASLB July 6, 2011) (order granting Clearwater’s amended contention). As this Board noted, “These populations include not only the Sing Sing prisoners mentioned by the Board in LBP-08-13, but also other EJ populations within 50 miles of Indian Point in pre-schools, nursing homes, shelters, hospitals, and minority and low-income residents in the region who lack access to private transportation.” *Id.* at 56.

Entergy and the NRC staff once again argued that the EJ contention raised an emergency planning issue outside of the scope of the proceeding. *Id.* at 54-55. But in its decisions on the initial contention and the amended contention this Board has twice confirmed that EJ concerns are a legally required part of any NEPA analysis of licensing activity and consideration of significant accidents and emergency planning is required within this analysis. These decisions are the law of the case.<sup>1</sup>

### **BURDEN OF PROOF FOR ENVIRONMENTAL MATTERS**

The NRC Staff carries the burden of proof to demonstrate that the Staff’s analysis took the required hard look at environmental justice issues and reached scientifically valid

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<sup>1</sup> The Board has previously recognized the value of avoiding repetition and duplication of effort. As the Board explained in *Private Fuel Storage*, “The principle of collateral estoppel, like that of *res judicata*, can also be applied in administrative adjudicatory proceedings.” *Private Fuel Storage, L.L.C.* (Indep. Spent Fuel Storage Installation), LBP-02-20, 56 N.R.C 169, 182 (Oct. 15, 2002) (internal citations omitted); *see also Ala. Power Co.* (Joseph M. Farley Nuclear Plant, Units 1 and 2), LBP-74-6, 7 A.E.C. 98, 101 (Jan. 17, 1974), (“the doctrines of *res judicata* and collateral estoppel do have application to administrative proceedings and have a valid and worthy purpose compelling that they be seriously considered wherever parties and stated issues have a prior history indicating possible duplication or repetition of effort”).

conclusions. *See* 10 C.F.R. § 2.325 (2011) (“Unless the presiding officer otherwise orders, the applicant or the proponent of an order has the burden of proof.”). The Nuclear Regulatory Commission has described the burden of proof in a license renewal proceeding as follows:

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

*Amergen Energy Co.* (Oyster Creek Nuclear Generating Station), CLI-09-7, 69 N.R.C. 235, 269 (Apr. 1, 2009) (internal quotations omitted) (emphasis in original). Thus, according to the Commission, if a party challenges a licensing renewal application, that challenging party must establish a *prima facie* case that renewal requirements have not been met. At that point, the burden of proof shifts back to the applicant to rebut that specific contention.

Environmental justice issues are “adverse impacts” that fall heavily on minority and impoverished citizens. *See Claiborne*, 47 N.R.C. at 106. To establish a *prima facie* case in an environmental justice claim, the Board has found that petitioners must provide: (1) sufficient support of the “alleged existence of adverse impacts or harms on the physical or human environment”; and (2) evidence that these “purported adverse impacts could disproportionately affect poor or minority communities in the vicinity of the facility at issue.” *South. Operating Co.* (Early Site Permit for Vogtle ESP Site), ASLB-52-011-ESP, 65 N.R.C. 237, 262, (Mar. 12, 2007). These potentially affected poor and minority communities are known as environmental justice communities. *See La. Energy Servs., L.P.*, 47 N.R.C. at 100. At the contention stage, intervenors must allege specific facts which support the existence of adverse impacts or harms on the environment, *see Public Serv. Co. of N.H.* (Seabrook Station, Units 2 and 2), CLI-89-03, 29

N.R.C. 234, 241 (Mar. 6, 1989), which are particular to the case at hand. *See North. States Power Co.* (Prairie Island Nuclear Generating Plant, Units 1 and 2), ASLB-50-282-LR, 50-306-LR, 68 N.R.C. 905, 915-16 (Dec. 5, 2008). Therefore, most intervenors with environmental justice claims need not go far beyond the facts alleged at the contention pleading stage to establish a prima facie case at hearing. This is because to establish a prima facie case for a NEPA contention, it is only necessary to show that the NRC failed to take a “hard look” at the issues raised by the contention.

## **FINDINGS OF FACT**

### **1. Summary of Environmental Justice Analysis in the FSEIS**

To a large extent, it became clear during the hearing that the NRC Staff’s assumptions about what the EJ analysis for the FSEIS would find determined its outcome. Before it embarked on the FSEIS the staff narrowed the scope to cover only the disparate impacts caused by normal operation of the reactor during the 20 year period of extended operation. NRC Staff SoP at 11. The Staff did not assess the EJ impacts of severe accidents because it regarded such an assessment as outside of what is required. *See Hr’g Tr.* 2756:13-25 (Oct. 23, 2012) (“Tr.”). It based this conclusion on the generic analysis of severe accidents, even though it acknowledged that EJ impacts could be disproportionate when effects on the general population are small. *Tr.* at 2757:12-2758:3. Based upon the exclusion of severe accident impacts, the Staff concluded that “[t]he only potential impact is the continued operation of the plant and the radiological risks that are associated with that continued operation.” *Tr.* 2736:24 - 2737:2. This meant the Staff did not look at most of the issues raised by Clearwater. *Tr.* 2757:1-7.

To carry out the EJ analysis, the Staff compared the impacts from the existing normal operation to the impacts from normal operation in the period of extended operation. *Tr.* 2739:12-24. Unsurprisingly, it found these impacts to be similar. For example, Mr. Rikhoff stated that

“[f]rom an operational standpoint, we could not discern that there would be an increase in the workforce at the plant or that radiological releases would be increased.” Tr. 2752:13-16. The Staff concluded that there are “no effect[s] for which to investigate, no increased new or added effect that we would be required to investigate under our current guidance.” Tr. 2752:17-19 (Mr. Rikhoff).

Although the Staff could not conceive of any potential change in impacts, it nonetheless identified the locations of the EJ population by analyzing census data at the block group level to identify environmental justice communities within the fifty-mile radius of Indian Point. Clearwater SoP 19-20. The Staff chose the census block group data because the smaller census block level data does not have data on income. Tr. at 2746:21-2747:3. Mr. Rikhoff explained that “in identifying minority and low-income populations, we use census [block group] data. And we identify all peoples who are of a different race, of a different ethnicity. Simply, we subtract out the white non-Hispanic population from the total population that is being examined. The remaining population is minority by definition.” Tr. at 2738:1-8.

Having merely plotted out the locations of the environmental justice populations and narrowed the scope to just changes in operational impacts over 20 years, it is not surprising then that the Staff concluded that the impacts on the EJ populations would be the same as on the general population. *See* Tr. at 2736: 21-2737:7.

## **2. Staff's Supplemental Environmental Justice Analysis at the Hearing**

At the hearing, the NRC Staff clarified some of the limitations of the analysis it did for the FSEIS. In addition, the Staff and Entergy went somewhat beyond the FSEIS analysis to discuss the radiation impacts of accidents upon prisoners at Sing Sing prison. With regard to limitations, the Staff Stated that it never goes beyond an analysis at the block group level. Tr. at 2898:7-11 (Rikhoff). This approach is based on the Staff’s interpretation of the NRC guidelines

for EJ analysis and Executive Order 12898. Tr. at 2896:19-21; 2897:14-2898:6. Based on this approach, Mr Rickoff has done the EJ analysis for 50 license renewals and has not found any disproportionate impacts. Tr. at 2898:23-2899:4. While it is theoretically possible that this analysis could be correct, we believe it is more likely that this indicates a methodological problem with the way the analyses were conducted.

The Staff acknowledged that analysis at the census block level is superior “for identifying the location of minority communities (...).” Ex. NRC000063 at A23; *accord* Tr. at 2895:16-19; 2896: 22-25 (Rikhoff). It is undisputed that at the block level, the data identify individuals in group quarters. Tr. at 2747:4-24. The group quarters classification is further subdivided into various kinds of institutions and other group living situations. Tr. at 2904:20-24. Showing its utility, Entergy analyzed the block level data to find that there are 67 correctional institutions within 50 miles of Indian Point. Ex. ENT000258 at A51; Tr. at 2905:15-25 (Riggs). Entergy agreed that from the census block information it is possible to see that Sing Sing is 89% minority. Tr. at 2903:23-2904:4. The Staff acknowledged that the FSEIS did not discuss these populations. Tr. at 2906:16-19.

We find that there are a number of gaps in the Staffs analysis. First, there are prisoners and other institutionalized EJ populations that the Staff failed to identify in the EJ analysis. The Staff could have determined the locations and populations of these institutions by using the census data. Second, the Staff acknowledged that it had not studied whether the existing plant operations are already having a disproportionate impact on EJ populations. Tr. 2753:2-13, 2913:2-8. This means that the Staff could have missed disproportionate EJ impacts by merely looking at whether operational impacts in the period of extended operation would be different to existing operational impacts, rather than comparing predicted impacts, including severe

accidents, to the no-action alternative. Third, the Staff did not systematically study the impacts of severe accidents on the EJ population.

With regard to analysis of radiation impacts during severe accidents, the Staff presented the testimony of Ms. Patricia Milligan, a health physicist who did not attempt to look at EJ populations specifically, but rather looked at all populations. Tr. 2761:19-24. She conceded that it is possible that EJ populations, such as the inmates at Sing Sing, could receive higher radiation doses during an accident. Tr. 2760:22-2761:2. However, she stated that such differences are within EPA guidelines that at projected dose of one to five rem the general population should evacuate, while projected doses of up to ten rem could be tolerated, before special populations like prisons would need to evacuate. Tr. 2762:6-23. She regarded this as different, but not disproportionate. *See* Tr. 2763:4-12. She further acknowledged that NRC has not looked at whether EJ populations would be at higher risk from radiation during an accident compared to the general population. Tr. 2893:2-13.

Although the NRC Staff gave some consideration to accidents at the hearing, that was limited to discussing radiological health impacts for Sing Sing prisoners based on the assumption that everything would go according to plan. This assumption may not be realistic. For example, in discussing the EPA guidance on evacuation, Ms Milligan failed to note that the EPA guidance points to other dangers that could result from evacuating the general population before the institutional populations, such as the danger that attendants may leave with the general population. ENT00284 at 5-19. The Staff also failed to note that at Fukushima many significant effects other than radiation health were observed. Thus, we conclude that the Staff's consideration of accident impacts at the hearing was far from comprehensive and was not

designed to address the issue at hand, which is to what extent EJ populations would be affected differently to the general population.

Entergy's testimony on EJ at the hearing was limited. Entergy acknowledged it has done no study on whether its outreach to minority populations was successful. Tr. 2899:20-2900:4. Nor has Entergy done a site-specific study of the suitability of buildings around Indian Point for sheltering in place. Tr. 2900:15-23.

### **3. Evidence Regarding Disparate Impacts Upon Environmental Justice Populations**

#### **a. The Katrina and Fukushima Disasters Illustrate That Disparate Impact Is Expected During Both Nuclear and Natural Disasters**

The Katrina and Fukushima disasters illustrate the types of impacts that the Staff would have found if it had looked more comprehensively at accident scenarios, rather than giving them a cursory examination at the hearing. The Katrina disaster confirmed the intuitive proposition that the effects of disasters fall disproportionately on the most vulnerable such as the poor, the sick, the elderly, and the incarcerated. Unfortunately, a disproportionate number of the poor and the incarcerated are from racial or ethnic minorities. This is largely because the most vulnerable have the lowest ability to take self-help measures and are often most in need of external support services. The Fukushima disaster confirmed that the most vulnerable experience the most severe effects from nuclear disasters for very similar reasons.

The Fukushima disaster tragically confirms that the most vulnerable populations suffer most in an emergency situation. Ex. CLE000047 at A.11. A few examples from Fukushima suffice to show that a nuclear emergency at Indian Point would be likely to cause serious disparate impacts. In one hospital three miles from Fukushima, 25 of the 435 patients died during the evacuation or at transit centers. *Id.* In addition, elderly patients were left in freezing conditions and there was inadequate provision for medical treatment at evacuation centers. *Id.*

The disaster also confirmed that shelter-in-place without further support does not work beyond a few hours, because people run out of food and water rapidly. Ex. CLE000050 at 7. The experience therefore underscored the importance of, for example, accounting for how people who are sheltered in place would get water, food, and if the buildings used as shelters have proper ventilation. Tr. at 2858:3-8 (Filler).

Clearwater's evidence shows that at Fukushima members of EJ populations died as a result of the accident, while healthy people with their own transportation were not as badly affected. Ex. CLE000047 at A11 (Dr. Edelstein). Newspaper articles sum up the grim realities of the situation. "Nuke evacuation fatal for old, sick" encapsulates in a nutshell that at Fukushima members of EJ populations died as a result of the accident, while healthy people with their own transportation were not as badly affected. Ex. CLE000054. The article shows that at one home for the elderly, the home's 96 residents were evacuated as they ran out of medicine and faced starvation. *Id.* One of them died on the bus, and two others fell seriously ill. *Id.* Another article states "Japanese earthquake takes heavy toll on aging population." Ex. CLE000052. Dozens of elderly people were confirmed dead in hospitals and residential homes as heating fuel and medicine ran out. *Id.* In one incident, Japan's self-defense force discovered 128 elderly people abandoned by medical staff at a hospital six miles from the Fukushima nuclear plant. Most of them were comatose and 14 died shortly afterward. *Id.* Another article states that "botched efforts to evacuate patients from area hospitals [close to Fukushima] lead to a number of deaths." Ex. CLE000053. By February 2012, 573 deaths had been certified as related to the Fukushima disaster. Ex. CLE000055. Notably, these deaths were not caused by radiation exposure, but by fatigue or aggravation of a chronic disease. *Id.* EJ populations, such as the elderly, the disabled, and the infirm, are most susceptible to such effects.

Furthermore, Fukushima (and Chernobyl) have demonstrated that nuclear disasters are not just a matter of impacts stemming from acute radioactive exposures, perhaps to Iodine-131 in the plume, but that cesium and other radioisotopes get deposited in the ground, in the groundwater, and in the food supply creating a whole host of impacts further impacting those sheltering in place within the environmental impact area. Tr. at 2854:21-2855:2 (Dr. Kanter).

During the hearing Dr. Larsen testified about the health impacts Hurricane Katrina had on the most vulnerable. His testimony confirms the effects of disasters fall disproportionately on those who are poor, sick, in hospitals, in nursing homes, disabled, and minority individuals. To this effect, he testified that when he arrived in New Orleans on August 31, 2005, there were 40,000, primarily poor, people left behind who could not evacuate mainly because of a lack of means or were in hospitals, nursing homes or disabled. Tr. 2807:6-24 (Dr. Larsen). By not being able to evacuate, these people experienced a “total (...) breakdown” of the system, Tr. 2807:10, in terms of the very limited medical care that was available to them as opposed to more affluent population that would seek treatment outside the affected area. Tr. 2811:15-2812:3 (Larsen).

These facts have not been contradicted by the NRC Staff or Entergy. We therefore find that if an accident were to happen, disparate non-radiation impacts are likely to be inflicted upon EJ populations. These effects have not been assessed by the NRC to date.

**b. Disproportionate Impacts Upon EJ Populations Arise From the Unusual Nature of those Populations**

As discussed above, the NRC Staff did not go beyond the block group analysis to do a detailed assessment of the EJ communities that it identified in its initial screening analysis. This approach, combined with the exclusion of accident scenarios, meant that the Staff failed to identify any potentially disproportionate impacts. Dr. Edelstein testified during the hearing that this approach is insufficient: “the whole purpose of not addressing environmental justice in the

generic study, but having it go into the site-specific study, is that the peculiar, particular or site-specific issues can in fact be magnified and understood at that level, so (...) decision-makers, have information as [they] make decisions about what the potential environmental justice impacts are. Just [identifying these populations] on a map and not even recognizing that there are any implications” is nonsensical. Tr. at 2793:11-22 (Dr. Edelstein). This is because these peculiar factors can give rise to the potential for disproportionate impacts. For example, for EJ populations inside prisons one peculiar factor is that the population is incarcerated. *See* Tr. at 2795:11-20 (Dr. Edelstein); 2906:3-19 (Riggs).

The potential for peculiar factors to give rise to disproportionate impacts is readily apparent on the face of the Emergency Plans prepared by the counties, but it appears that NRC Staff did not review these plans during the preparation of the FSEIS. The testimony of Dr. Edelstein and Mr. Filler shows that on its face the Emergency Plans for Westchester County contemplates the use of “selective shelter-in place,” where so-called “special populations (prisons, nursing homes etc.)” are left behind while the general population evacuates. *E.g.* Ex. CLE000003 at A9. For example, the Westchester Plan even provides a definition of “shelter in place” as “an action that . . . would be taken by persons who should be evacuated but cannot because of . . . transportation resource shortfalls (or) special populations (prisons, nursing homes etc.)” Ex. CLE000009 at A3; Ex. CLE000014 at IPEC00200120. The document also states that while the general population is being evacuated in a general emergency, shelter-in-place is an option for the institutionalized mobility impaired, hospitals, and mental health facilities. Ex. CLE000014 at IPEC00200291. The Westchester County Emergency Plan states that shelter-in-place may be appropriate for “those who are not readily mobile” at up to 5 rem in normal circumstances and 10 rem under “unusually hazardous circumstances.” *Id.* at IPEC00200116. In

contrast the dose limit for the general population is 5 rem even under “unusually hazardous circumstances.” *Id.* Mr. Filler concludes that: “the Westchester County Emergency Plan expressly recognizes that there is a likelihood that environmental justice populations, including prison populations, and physical and mentally disabled, immobile and infirm populations, will be treated disparately by being sheltered in place when they ‘should be evacuated’ and are likely to be exposed to rem limits far in excess of what the evacuated population would be exposed to. Further, there is no plan for how these populations will receive water or food, and it is unclear how the shelters will be safely ventilated.” Ex. CLE000009 at A3.

Similarly, the Rockland County Emergency Plan treats many EJ populations differently to the general population. In the Rockland plan, two hospitals are designated as special facilities that use “selective shelter-in-place” meaning that the patients would shelter-in-place while the general population evacuates. Ex. CLE000003 at A16. It defines “selective Shelter-in-place” as an option for those who “could not be safely evacuated,” including “those who have been designated medically unable to evacuate as well as those individuals who require constant, sophisticated medical attention or are incarcerated.” Ex. CLE000018 at IPEC00200992. The plan also identifies 4,629 individuals in the ten mile EPZ who are “transit dependent,” *i.e.* who “do not have their own means of evacuation.” *Id.* at IPEC00201078. The same buses used for schools are also used for the “transit dependent” population, therefore they must wait until after the school evacuation is complete. *Id.* at IPEC00201078. Although those people are supposed to shelter-in-place prior to arrival of the bus, it is unclear how this is possible. *Id.* In addition, the plan identifies 1,058 mobility-impaired individuals in special facilities, and 60 non-institutionalized mobility impaired individuals in the 10 mile EPZ. *Id.* at IPEC00201078-79.

Evacuation of this group of people also would appear to require many of the same vehicles used to evacuate the students and other “transit dependent” populations, and therefore they too must wait until after the school evacuation is complete. *Id.* It is again unclear how this group could shelter-in-place while awaiting transportation, and whether or how an up-to-date list of the location of non-institutionalized mobility-impaired individuals would be maintained. Once again Mr. Filler concludes that the Rockland County Emergency Plan expressly recognizes that there is a likelihood that environmental justice populations, including those who are medically unable to be evacuated, in nursing homes, or incarcerated will be treated disparately by being sheltered-in place when they should be evacuated and could to be exposed to radiation doses that could be double those to which the general population would be exposed. Ex. CLE000009 at A4.

Finally, this evacuation planning does not extend beyond a ten mile radius. This is a major issue because there are over 6 million people in potential EJ areas within 50 miles of Indian Point, mainly in New York City. Ex. CLE000031. As the Fukushima accident has demonstrated, contamination can rapidly spread beyond 10 miles triggering the need for evacuation. The NRC recommended evacuation of U.S. Citizens up to 50 miles around that plant. Ex. CLE000048 at A.4. Even the NRC’s former chairman admitted that the areas beyond 10 miles could require further action. *Id.* Over 11.5 million people live within 50 miles of Indian Point, of whom over 6 million are in potentially members of EJ populations. Ex. CLE000031. A nationally recognized leader in disaster planning recently stated “the consequences of a problem [at Indian Point] are so devastating in such a densely populated area that I think we have a moral, ethical obligation to make sure we have solutions that are viable before allowing such a dangerous thing.” Ex. CLE000046 at A.17. Kelly McKinney, New York

City's deputy commissioner of preparedness stated on June 2012 that attempting to evacuate large areas of New York City would be an "enormous challenge" and a historic feat. "At no time in the history of man," he said, "has anyone tried to move 17 million people in 48 hours."<sup>2</sup>

Clearwater has shown that there are over 1,100 nursing homes, correctional facilities, homeless shelters, hospitals, and housing for the infirm or those on low-incomes in the 10 and 50 miles radii. Ex. CLE000032 at 2. The information that Clearwater has gathered shows that many of these facilities contain substantial EJ populations. For example, many people in nursing homes are reliant on social security and therefore have a low income. Ex. CLE000010 at A55. A significant portion of the nursing home population is also mobility impaired for either mental or physical reasons. Ex. CLE000006 at A6. The population of Rockland County Jail is 60 to 70% minority. CLE000003 at A16. Homeless shelters and Section 8 housing house low-income individuals. CLE000036 & CLE000037. Minority and low-income residents are highly dependent on public-transport. CLE000007 at A12; CLE000008 at A16. Hospitals contain a number of patients who are mobility impaired. CLE000005 at A7.

Thus, the FSEIS has failed to identify many EJ populations that are present in the 50 mile radius of Indian Point, has failed to identify peculiar characteristics of the EJ communities it has identified, and failed to recognize that the County emergency plans actually anticipate a disparate impact on EJ populations. The NRC Staff made these errors despite Clearwater successfully proposing a contention on this issue and comments on the DSEIS pointing out this flaw. FSEIS at A-112; A-118; A-119. These examples demonstrate that it is impossible to identify what peculiar factors some of these EJ populations may have by simply looking at a "splotch" on a diagram. Tr. at 2794:1-3 (Dr. Edelstein). Because this was the approach taken by the NRC Staff,

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<sup>2</sup> Daily Mail, An accident waiting to happen? Populations around U.S. nuclear plants have grown 450% since 1980, CLE000056.

the FSEIS does not identify any other characteristic particular to incarcerated, transport-dependent, geographically isolated, or any other EJ populations. *See* Tr. at 2906:16-19 (Rikhoff); Ex. CLE000045 at 2 and Tr. 2792:7-12 (Dr. Edelstein). The evidence presented by Clearwater illustrates that to determine disparate impacts, the Staff must first determine what are the unusual characteristics of the EJ populations that could give rise to disproportionate impacts.

**c. The NRC Staff's Interpretation of the NRC Guidance Has Been Inconsistent**

The EJ analysis conducted for the Indian Point relicensing is less thorough than that done for the VC Summer new reactor license, even though both analyses were designed comply with the same NRC guidance. In a 2012 presentation entitled *Environmental Justice and the NRC: A Progression to Excellence*, the NRC discussed the environmental justice analysis in that case, noting that “[a]nyone without full access to, or protection from, the decision making process is conceivably an environmental justice constituent” and that it is important to look for the “less obvious” constituents, like the elderly, those on fixed incomes, and those with special needs. Ex. CLE000051 at 4.

The NRC Staff then sought to show how diligently it had examined “factors peculiar to [the] communities.” *Id.* at 8. To that end, the NRC discussed its process in assessing South Carolina Electric & Gas’s application to build the VC Summer Nuclear Station in Fairfield County, South Carolina. *Id.* at 9-20; *see also* Ex. CLE000047 at A9. According to the NRC’s own account, the use of census block group data alone was insufficient in the VC Summer case. Although the screening analysis revealed a large number of majority African-American census block groups near the plant, it failed to identify any low-income populations of note in the vicinity of the plant. Ex. CLE000051 at 12. However, commentary at the scoping meeting showed the NRC that a newly incorporated community named Jenkinsville, which was the

closest community to the proposed plant site and most of whose population was below the poverty line and unemployed, had been overlooked. *Id.* at 16-17.

In contrast to the analysis at Indian Point, the NRC's Staff doing the EJ analysis for the VC Summer license interpreted the NRC guidance as being more expansive in terms of populations covered and the depth of analysis that was done. At VC Summer, the Staff went beyond the block group analysis, listened to members of the public, and by that means identified the particular features of the community, including that many members of the community were unable to participate in the formal meetings, despite being seriously concerned about the plant. *Id.* at 17. In addition, most of the population walked as a primary means of transportation, making increased traffic on the roads that led to the site – narrow two-lane roads with little or no shoulder – very burdensome on them. *Id.*

As a result of this analysis, the NRC tailored specific mitigation responses to the particular challenges faced by this community, including holding more informal meetings to receive comments from the local community and allowing commentators to have their comment personally transcribed by NRC staff. *Id.* at 18. In addition, South Carolina Electric & Gas committed itself to traffic impact mitigation in response to concerns about pedestrians. *Id.* at 19. The NRC Staff has touted the VC Summer Nuclear Station EJ analysis as a model of good practice, but here it serves to show that the Staff's environmental justice analysis for the Indian Point plant was far more limited and that the Staff has interpreted the guidance inconsistently.

During the hearing Dr. Edelstein concluded that Exhibit CLE000051 demonstrates that to identify environmental impacts in environmental justice communities it is necessary to go further than census block group analysis. Tr. at 2790:19-23. In the LES case, the Staff used a conventional approach and they missed the impacts. "In the second case, they start out with a

conventional approach, but then (...) made themselves available and learned about a community that was an EJ community . . . . They were then able to meet with and (...) identify what the issues were, and to accommodate in . . . mitigation the needs of that community.” Tr. at 2790:10-19 (Dr. Edelstein). The Staff’s description of the VC Summer EJ analysis makes clear that the NRC Staff has the capability of conducting a more thorough environmental justice assessment – it simply failed to do so in this case.

**d. Disparate Impacts Could be Inflicted Upon Prisoners During an Accident**

It is undisputed that the FSEIS did not specifically identify EJ populations in prisons. The NRC’s failure to identify important EJ sub-populations, such as members of racial minorities who are incarcerated approximately 10 miles from Indian Point, is particularly glaring in the case of Sing Sing, a correctional facility that is a census block unto itself, where 87% of its 1,700 prisoners are members of racial minorities. Ex. CLE012 at 12. As discussed above, based upon an assumption that the identified EJ populations had no distinguishing characteristics except for racial status and low income, it concluded that no disparate impact would occur. The problem is that in the case of prisoners at Sing-Sing even the Staff has admitted that this assumption is false. In fact, as shown above, Sing Sing is designated as a “special facility” in the Westchester County Emergency Plan indicating that inmates within the facility could experience impacts that are quite different from the general population. Ex. CLE00003 at A8 & A11; Ex. CLE000012 at 4-5. However the EJ analysis took no account of the “special” status of the prison population. Many other correctional institutions are similar. For example, the population of Rockland County Jail is 60 to 70% minority. CLE0003 at A16. As also discussed above, Entergy found 67 other correctional facilities within 50 miles of Indian Point when it used more detailed census data that the Staff used in the EJ analysis. Exhibit ENT00258 A.51; Tr. 2905 at 15-21.

With regard to radiation impacts, Ms. Milligan of the NRC Staff recognized the possibility that special populations, like Sing Sing, could receive radiation doses higher than other populations that are immediately able to self evacuate. Tr. at 2760:22-2761:2 (Milligan). EPA guidance also explicitly recognizes that prisoners and others who are hard to evacuate would likely receive a higher radiation dose. The parties agree that the EPA dose guidelines establish different dose ranges for different groups of the population. Exhibits NRC63 at A37; ENT258 at A.64. Indeed, because of the higher risk associated with evacuation of some special groups in the population (e.g. incarcerated populations, institutionalized, those who are not generally mobile), the guidelines provide that sheltering in place may be the preferred alternative for these selective populations as a protective action at projected doses of up to five (5) rem. In addition, under unusually or extremely hazardous environmental conditions use of sheltering at projected doses of one (1) up to five (5) rem for the general population and up to ten (10) rem for selective groups. Tr. at 2762:19-23 (Milligan).

Thus, by allowing protective actions for special populations be taken after a potential radiation exposure that is double that permitted for the general public, EPA guidelines allow for disparate impacts. As discussed above, the NRC acknowledged that prisoners and could receive higher doses than the general population. The Staff, however, asserted that these higher doses would be insignificant if the EPA guidelines were not exceeded. Exhibit NRC258 A.39 (Milligan); Tr. at 2763:9-12 (Milligan). The Staff argued that these guidelines would be met provided evacuation was possible within 4 days. Tr. at 2763:16-23 (Milligan).

Ms. Milligan believed that for Sing Sing prisoners doses would be within EPA guidance because New York Department of Corrections has plans for the timely evacuation of Sing Sing. See Tr. 2771:7-16. This information was obtained in three-hour interview on September 30th,

2012 after the FSEIS was complete. Tr. at 2768:11-19 (Milligan). In this interview the employee assured NRC that Sing Sing inmates would be evacuated in a timely fashion to ensure that radiation doses will not exceed EPA guidelines. Tr. at 2771:12-16 (Milligan). Furthermore, during redirect it became clear that this assurance was based on the opinion of Colonel Kirkpatrick of New York Department of Corrections that prisoners become more co-operative during emergencies. Tr. at 2910:14-24.

This issue presents the major factual disagreement in the testimony. As discussed in more detail below, Clearwater presented credible testimony contradicting the notion that emergencies lead to co-operative prisoners from Mr. Papa, a former Sing Sing inmate, Dr. Edelstein, a sociologist who related experiences in this area from Hurricane Katrina, and Dr. Larsen, who provided emergency medicine for prisoners during Hurricane Katrina. Both Mr. Papa and Dr. Edelstein testified that during a nuclear emergency, prisoners are likely to become violent creating risks and hazards, like arson, to other inmates and guards. Tr. at 2805:10-18 (Mr. Papa); Exhibit CLE03 at A.11; & Tr. at 2796:8-13 (Dr. Edelstein). Dr. Larsen confirmed this supposition stating that in treating prisoners during emergencies doctors need guards and protection. Tr. at 2815:7-15. Some prisoners will take advantage of emergency situations to try to escape. Tr. at 2815:19-25.

Mr. Papa's evidence showed also that an expeditious and timely evacuation would be difficult even if there was no social disruption. He testified that the standard procedure for transporting prisoners is to shackle the inmates by their arms and legs and then transport them in small numbers with guards in a security vehicle. Exhibit CLE04 at A.10. Assuming it takes ten (10) minutes to shackle each prisoner and two (2) guards are dedicated to this task it would take one hundred forty one (141) hours or about six (6) days just to shackle all prisoners. *Id.* To

expedite this process security requirements may be lowered but then the danger that prisoners could use this opportunity to escape may increase. *Id.* Also, finding a place for one thousand seven hundred (1,700) maximum-security inmates when most jails in the area are lower security and are already full seem extremely difficult if not impossible. *Id.*

Potential evacuation of Sing Sing residents could also present vehicle availability issues. Tr. at 2800:16-19 (Edelstein). The Katrina incident as a case study provides valuable information regarding this particular. When the evacuation of more than 6,000 prisoners at the Orleans Parish Penitentiary, “OPP”, started there were only three (3) boats available with that capacity to transport a few people at a time. Exhibit CLE12A at 10 (Edelstein). While some prisoners waited for evacuation standing in water between chest and neck for as long as ten (10) hours, others were left for three (3) days in the scorching sun without food, water or shelter. *Id.*

In the disputed area of how fast Sing-Sing could be evacuated, Ms. Milligan acknowledged she was a health physicist without expertise in sociology who only reviewed the evacuation plans for Sing Sing during a three hour meeting. Furthermore, Ms. Milligan relied upon the correctional official's opinion regarding inmate behavior. In contrast, Clearwater’s three witnesses were expert in the field through experience and academic training. Given the Ms. Milligan’s lack of expertise and reliance on the opinion of a New York State employee, we conclude that the NRC has failed to prove that the EPA guidelines would be met. As discussed below, we also believe the Staff made a legal error when it used EPA guidance alone to determine significance and failed to reach an independent conclusion about prisoner behavior.

With regard to the significance of the difference in allowed dose, we find that the Staff also made a factual error. Entergy suggested that doses within the EPA guidelines would not be clinically significant. Tr. at 2777:15-18. Ms. Milligan also implied that doses within the federal

limits cause no adverse effect. Tr. at 2893:13-16. Both entities failed to note that even low doses of radiation are regarded by doctors as significant. Dr. Kanter clarified that there is a consensus in the medical establishment that there is no lower cutoff for health risk caused by radiation and that there is a linear relationship between exposure and risk. Tr. at 2855 at 14-18. Therefore, those receiving increased doses by sheltering when the general population is evacuating receive increased health burdens. Tr. at 2856:4-10. In this respect we conclude that the NRC Staff has erred by failing to recognize that even if the difference in radiation dose is within EPA guidelines, it nonetheless imposes a differential health burden.

With regard to mitigation, Ms. Milligan made clear that she did not consider the dose reduction provided by shelter-in-place. However, we cannot conclude that such sheltering would be effective to reduce radiation dose, because the Staff has done no site-specific analysis of how suitable buildings are for this purpose, whether ventilation systems and window sealing need improvement, the effect of ordering people without private vehicles to wait outside at bus stops, or how quickly the protection offered by shelter-in-place degrades. CLE000047 at A5; Tr. at 2801:7-23 (Dr. Edelstein). During the evidentiary hearing Entergy witness indicated that it had not conducted such study either. Tr. at 2900:15-24 (Slobodien).

Clearwater's evidence suggests that such sheltering would not be very effective. Mr. Papa's testimony regarding the structural inadequacies of Sing Sing to support an effective ventilation system shows that Sing Sing would be of limited value as a shelter-in-place facility during a severe accident. Mr. Papa testified that Sing Sing has no ventilation system and that, because of the lack of air conditioning, the only way to get any ventilation and air circulating in the housing blocks is if the windows are open. Tr. at 2804:4-13 (Mr. Papa). During summer, when humidity levels in the cellblocks are high, windows are left opened. Exhibit CLE04 at

A.13; Tr. at 2805:8 (Mr. Papa). Furthermore, by breaking the windows inmates constantly alter their physical integrity rendering them inadequate to protect residents from any potential environmental hazards. Tr. 2804:9-13 (Mr. Papa). Often windows are purposely left unfixed so that some air could circulate and to maintain bearable temperatures when these are closed. Exhibit CLE04 at A.13. Additionally, the buildings are very old. Tr. at 2805:5 (Mr. Papa). Sing Sing's oldest part opened in 1826 and was completed two years later making it one hundred eighty seven (187) years old. Exhibit CLE04 at A.13. In summary, we find that if the Staff wishes to take sheltering-in-place into account as a mitigation measure for radiation exposure, it would need to carry out a site-specific assessment of building conditions.

Turning to impacts other than radiation, Clearwater's testimony establishes that incarcerated EJ populations within the environmental impact area of Indian Point would likely suffer disparate non-radiation impacts. Sing Sing prisoners rely upon and depend on a highly controlled social structure to operate within a certain order. Tr. at 2798:1-10. Therefore, Mr. Papa testified that during a nuclear emergency, prisoners are likely to become violent. Tr. at 2805:10-18 (Mr. Papa). Predatory prisoners would try to take advantage of the situation to create chaos and attempt to escape creating a potentially dangerous situation for everyone in the prison, including guards, where arson is a likely scenario. Tr. at 2805:18-2806:4 (Mr. Papa). This would endanger everyone in the prison, including the guards. Tr. at 2806:5-8 (Mr. Papa). Dr. Edelstein agreed that a total breakdown of the social order would likely result from nuclear emergency at Indian Point. Tr. 2796:8-12 (Dr. Edelstein).

This testimony is not purely theoretical, it is based on the personal experiences of Mr. Papa and study of many disasters, including hurricane Katrina, by sociologists. Dr. Edelstein testified that a nuclear emergency at Indian Point has the potential for adverse impacts to the

inmate population at Sing Sing similar, if not identical to, those experienced by the inmates in Katrina. Exhibit CLE12A at 19. Hence, he testified that there would likely be a smaller guard population, as they could decide to evacuate the area diminishing the institution's ability to maintain order. Tr. at 2796:13-2797 (Dr. Edelstein). Although a crucial factor in ensuring social order, maintaining the habitability of the prison proved to be unattainable. For example, prisoners were deprived of functional water for flushing toilets and washing and potable water for drinking and food. Exhibit CLE12A at 8 (Dr. Edelstein). Ventilation failed; therefore prisoners broke windows and ripped the doors off to escape into the block. Exhibit CLE12A at 8 and 10 (Dr. Edelstein). Outside communication was cut off to prisoners and as result inmates lack information about their families' plans, how they fared the storm and their safety and whereabouts. Exhibit CLE12A at 8 (Dr. Edelstein). Some inmates and guards were left behind locked, even in the face of flooding. Some prisoners were mistreated, others jumped into floodwaters to escape, risking drowning, guards firing bullets and impalement on the barbed wires. Exhibit CLE12A at 10 (Edelstein). In sum the Katrina incident speaks to the potential impacts residents of Sing Sing could experience in case of a nuclear emergency at Indian Point.

With regards to other impacts, Mr. Papa testified that Sing Sing does not have any ventilation system, potentially exposing inmates at Sing Sing to extreme temperatures in case of a nuclear emergency at Indian Point. CLE0003 at Q.16. & CLE0004 at Q.3. As discussed above, with respect to disturbances, the Staff failed to reach an independent conclusion. We also find that the Staff failed to assess whether other non-radiation impacts could take place at correctional institutions during a nuclear emergency leading to a distinctly different impact on the EJ populations in these institutions compare to the general population.

**e. EJ Populations Would Have Less Access to Medical Treatment During an Accident**

Clearwater's pre-filed testimony showed that during an accident limited medical treatment resources would be available to the populations and communities residing within a 50-mile radius of Indian Point in an event of a severe accident. Exhibit CLE05 at A.9. Dr. Larsen's testimony at the hearing clarified how this potential scarcity disproportionately affects minority and low-income populations, Tr. at 2809:3-23 (Dr. Larsen).

Based on his experience as the Medical Director of the National Disaster Medical System Operations in New Orleans during the aftermath of Katrina, Tr. at 2807:7-8, Dr. Larsen argues, that in case of a nuclear emergency at Indian Point minority and low-income populations are likely to stay behind in the environmental impact area. Tr. at 2807:15-19 (Dr. Larsen). Experience shows that more affluent populations are likely to evacuate to safer areas while those without cars and limited economic resources to escape have to stay put. *Id.* To this effect, Dr. Larsen testified that when he arrived in New Orleans on August 31, 2005 there were 40,000 people left behind who could not evacuate, mainly, because they were low-income (or minority) individuals lacking the resources to do so, or were in hospitals or nursing homes. Tr. at 2807 :14-19.

During Katrina, these environmental justice populations experienced a total breakdown of the medical care system. Tr. at 2807:10-13 at (Dr. Larsen). Specifically, medical staff, emergency management services personnel, and other emergency response people, became unavailable or unwilling to fulfill their duties. Tr. at 2809:17-2810:4 (Dr. Larsen). Disaster agencies have confirmed that planned responses to emergencies break down for people who have families involved in a disaster. Exhibit CLE05 at A.5. For instance, during Katrina, medical and emergency personnel became unavailable, mainly because they were dealing with their own tragedies and problems. *Id.* Hence, out of twenty- four (24) hospitals in the greater New Orleans

area, the only three (3) that were structurally sound to operate could not provide services because there was no staff attending them. Tr. at 2810:5-19 (Dr. Larsen). As a result, the environmental justice population left behind had virtually no medical institution to which they could go until a federally funded emergency treatment facility was created at the New Orleans International Airport. Tr, at 2010:22-23 at (Dr. Larsen).

As in Katrina, Dr. Larsen testified that regional health care resources are likely to become scarce in case of a nuclear emergency at Indian Point and that what capacity may be available would quickly become overwhelmed. CLE0005 at A.9. To this regard, he asserted that given his experience treating one patient with severe radiological exposure, it is unrealistic to think that the existing facilities in the region could adequately deal with a serious accident at Indian Point. CLE0005 at A.7. This incident made him conclude that “[m]ass decontamination would be virtually impossible.” CLE0005 at A.4.

Moreover, Dr. Larsen asserts that minority individuals, coming generally from a poorer income, are likely to depend on emergency personnel for transport to hospitals. Tr. at 2813:16-22. Ambulance availability is likely to be triaged and people with access to personal transportation will be better able to get to a hospital or reception center, than those who cannot afford their own vehicles. Tr. at 2813:16-25 (Dr. Larsen). Furthermore, emergency personnel may be unable to reach sites to administer care and transporting non-ambulatory patients would be extremely challenging, especially those on ventilators or life-support. CLE0005 at A.7, A.9 (Dr. Larsen). For instance, Dr. Larsen states, low income and minority individuals who have people with special needs in their homes, who might depend on special vehicles or have to transport special devices will potentially be unable to do so in a timely matter. Tr. at 2812:19-23.

In addition to having lower access to very limited medical resources due to lower mobility, environmental justice populations have a diminished capacity to access follow up care. Although, the Emergency Medical Treatment and Active Labor Act (EMTALA) requires emergency response departments and emergency rooms to treat patients regardless of their ability to pay or whether they have medical insurance or not, once they are stabilized they can be refused medical care. CLE0005 at A.8; Tr. at 2808:8-2809:2. This potentially compromises the ability of low-income and minority individuals to obtain follow up care as compared with patients who have insurance coverage or can afford to pay for additional care. CLE0005 at A.8. This is particularly significant because those who would not get evacuated in a timely manner are likely to receive higher radiation doses and would, for the reasons stated above, potentially have more problems getting the follow up care they need. Tr. at 2813:6-10 (Dr. Larsen).

Dr. Larsen's testimony shows that under emergency conditions emergency services personnel may be unwilling or unable to reach sites to administer care, that ambulance availability will be triaged and that this potential lack of medical services would disproportionately affect the environmental justice populations that stayed behind because they cannot afford their own vehicles or are otherwise unable or unwilling to evacuate. We conclude that Dr. Larsen's testimony shows that the lack of mobility of EJ populations may lead to a differential in access to medical care. The Staff has not studied this issue at all. We therefore conclude that the Staff has failed to show that there is no difference in impacts upon EJ populations during a severe accident in terms of availability of medical care.

**f. Disparate Impacts Could Occur Due to Increased Reliance on Public Transport in EJ Communities**

Clearwater's evidence has shown that low-income and minority residents depend on public transportation to a far greater degree than the general population. We find that three

different factors may cause transport dependent residents to experience increased radiation impact during a severe accident compared to the general population. First, these residents have to walk to open air bus stops to wait for buses. Second, those buses will take longer to exit the evacuation zone because they have to stop to pick up other people. Third, in some cases the areas where these residents live are particularly geographically isolated.

As an example of a transport-dependent EJ community, Mr. Mair focused on Peekskill, which is within a mile and a half of Indian Point. Tr. at 2827:8-14 (Mr. Mair). According to the last census, New York is the sixth richest state in the United States, Westchester County the second richest county in New York State; and Peekskill, which has a population around 22,000 with a median income around \$53,000 (which ranges \$20,000 to \$40,000 below surrounding communities), is one of its poorest communities. Exhibit CLE07 at A.6. (Mr. Mair).

Additionally, the estimated total non-White population is slightly over 50% with a significant number of undocumented Hispanic residents. *Id.* Over 60% of the population in Peekskill is low income or minority. *Id.* at A. 11 (Mr. Mair). Thus, among other things, Mr. Mair's testimony establishes the existence of Peekskill an environmental justice community within a mile and a half of Indian Point. In addition, many other EJ communities are evident from CLE00031, which depicts potential EJ areas within 50 miles of Indian Point and shows that there are around 6 million people within those areas.

Having established the existence of the EJ population in Peekskill and elsewhere, Mr. Mair turned to the nature of these communities. He identified specific characteristics that make disparate impact likely such as a high reliance on public transport, high population density, and the geographical challenges of egress from certain areas, like Peekskill. *See generally* Exhibit CLE07.

With regard to dependency on public transportation, Mr. Mair stated that car ownership tends to be lower within low income and minority individuals than compared to more affluent groups. Ex. CLE07 at A.12. For example, because the City of Peekskill is predominantly a low-income working class community, it is heavily dependent on public transportation. Tr. at 2832:10-16 (Mr. Mair). Within 20 miles of Indian Mr. Mair also identified Haverstraw, West Haverstraw, Ossining, and White Plains as containing EJ communities that are dependent on public transport. Ex. CLE07 at A12. Further away, he stated that Beacon, Newburgh, Yonkers, the Bronx, Manhattan, Queens, and Brooklyn also contain EJ communities that are dependent on public transport. Ex. CLE07 at A16.

He stated that this dependency could lead to disparate impact. For instance, during hurricane Katrina transport-dependent EJ populations experienced a large differential impact when buses did not arrive as planned. Ex. CLE07 at A12. Mr. Mair also quoted from a study finding that the experience of hurricane Katrina shows that the combination of low car-ownership rates among black households coupled with racial housing segregation rendered evacuation plans based on private transportation most ineffective for predominantly minority communities. Exhibit CLE07 at A12. This type of issue could recur. *Id.*

Ms. Guardado, a member of the Hispanic community of Peekskill, agreed with Mr. Mair, and emphasized that her community's reliance on public transportation "is the norm and not the exception." Exhibit CLE08 at A.17. Further, she identified that this heavy reliance on public transportation is likely to trigger disparate impacts should an emergency occur in Indian Point and an evacuation required. *Id.* For example, Ms. Guardado testified that, because in an evacuation scenario the majority of Peekskill's Hispanic community is not able to immediately jump in a car to escape danger, they would be asked to wait at bus stops to be picked up and

transported to safety. *Id.* Reinforcing the point that even if the buses arrive as planned, transport-dependent populations will be subject to differential impact, Ms. Greene showed a picture of a bus stop that is simply a sign at the side of the road. Tr. at 2859:6-20 (Ms. Greene); CLE0056 at 5. It showed clearly that there is no shelter whatsoever for residents at the bus stops. *Id.* Therefore, transport-dependent residents will have to wait outdoors for transport and be exposed during that time, unlike the general population. Tr. at 2859:14-20 (Ms. Greene)

We therefore conclude that many EJ communities are more dependent on public transport than the general public. In turn, even if evacuation plans are effective, dependency on public transport could lead to higher radiation doses in case of an accident because residents without private vehicles would have to wait in the outdoors before being picked up on a bus. In addition, it is inevitable that the buses would take longer to transport residents out of the evacuation area because the bus would have to stop to pick up other residents. In contrast, those with their own vehicles would not have to wait at open-air bus stops before commencing their journey and would take the most direct route to evacuate without stopping within the evacuation zone. This inherent disparate impact must be assessed by the NRC Staff using realistic assumptions.

The disparate impact caused by transport-dependency could be exacerbated by other site-specific factors such as high population density and geographical isolation. Taking population density first, Mr. Mair stated that poor people tend to live closer together than the general population. Exhibit CLE07 at A.11. For example, Peekskill has a population density of 5,399 people per square mile, much higher than the density of Westchester as a whole, which is 2,205 per square mile, and New York State which is 411 per square mile. *Id.* Many other nearby cities have large poor and minority populations and high population density, including: Yonkers, approximately 25 miles from Indian Point, with a population density of 10,880 per sq. mile;

White Plains, approximately 21 miles from Indian Point, has a population density of 5,820.3 per sq. mile; and New York City, approximately 27 miles to the Bronx line, a population density of 27,012 per sq. mile. *Id.* Thus, Mr. Mair concluded, the higher proportion of poor people, minority individuals, and the higher density of population in Peekskill and other EJ neighborhoods could have adverse implications for evacuation in a radiological emergency. *Id.*

With regard to geographical isolation, Mr. Mair testified that Peekskill has rugged topography and a limited number exit routes. Exhibit CLE07 at A.13; Tr. at 2828:5-2832:9. These characteristics, Mr. Mair argued, would make it extremely difficult to evacuate Peekskill. Exhibit CLE07 at A.13. Moreover, most of the public transportation routes head south, which could lead people into harm's way. Tr. at 2832:16-25. Mr. Mair proceeded to describe in detail which routes of egress are available to Peekskill residents and their characteristics. Exhibit CLE07 at A.13. The west is cut off by the river and the route north is very narrow. Tr. at 2829:6-13 (Mr. Mair). The route east is a little wider, but heads into dense suburban areas. Tr. 2831:15-23 (Mr. Mair). Some routes to the south, like Route 9, although wider, would direct the population towards even more densely populated areas of New York City, which would likely be gridlocked. Tr. 2828:10-23 (Mr. Mair).

We conclude that in addition to suffering more exposure due to the need to wait for buses and their longer travel time, Peekskill residents would also suffer additional exposure due to the geographical isolation of the area leading to even longer travel times compared to the general population. This issue is not unique to Peekskill, and therefore consideration of population density and geographical constraints should be included in the Staff's assessment of disparate impact for all EJ communities. Once again, the identified disparities then need to be analyzed by the Staff to determine whether they are significant.

With regards to non-radiation impacts, Ms. Guardado testified that, during a radiological emergency, seeing those with private vehicles evacuating expeditiously as others wait for in the open air for bus to be transported to safety could cause feelings of despair, unfairness, and hopelessness. Exhibit CLE08 at A.18 (Ms. Guardado). Under such circumstances, there is potential that the Hispanic community could react violently. *Id.* Such a violent reaction, she stated, could further delay and jeopardize any evacuation efforts and render the process unsafe for those waiting, increasing the likelihood of disparate impacts for the Hispanic community. *Id.*

**g. Elderly Residents Could Suffer Disparate Impacts in an Accident**

Clearwater has shown that there are over 65 adult care facilities within 10 miles of Indian Point and over 80 such facilities between 10 and 50 miles away. Ex. CLE000032 at 1-2. Many people in such facilities are reliant on social security and therefore have a low income. Ex. CLE000010 at A55. They also have other health problems. *Id.* Clearwater presented illustrative information on a few facilities. For example, at the Summit Park nursing home most of the 357 residents are on low incomes. *Id.* at A59; A66. At the Maryknoll Sisters Center for retired nuns, all the residents have taken a vow of poverty. *Id.* at A.98-99. At the Golden Acres assisted living, 70% of the 80 residents are minority. *Id.* at A77.

Mr. Simms' personal experience at an assisted living home provides insight into potential disparate impacts and existing concerns, especially for residents in facilities close to Indian Point. While Bethel Springvale Inn, where he lives, may not host a low income population, it certainly hosts an elderly population. Tr. at 2847:20-2848:4. Mr. Simms noted that only 10% of the population of the facility can walk without a walker and many are in wheelchairs. Tr. at 2848:20-25. Additionally, 40-50% of residents require medication. Tr. at 2849:4-6. For many residents this medication is kept under lock and key by the staff, so few residents would be able to evacuate by just grabbing their pills. Tr. at 2849:7-18. There are many other elderly residents

in this area. Tr. at 2849:19-2850:5. Because road access to this area is limited, it would be difficult to get transportation to it. Tr. at 2850:6-12. Even if the approach was to shelter in place rather than evacuate, there could well be a shortage of essential staff to distribute medication, prepare meals, and do other tasks. Tr. at 2851:7-20.

We conclude that a disproportionate number of elderly people are low income, therefore the particular nature of elderly populations should be analyzed as part of the EJ analysis. Mr. Simms testimony shows that the disproportionate non-radiation impacts upon the elderly that were observed during the Fukushima accident in Japan could also occur if there were an accident at Indian Point. Therefore, in the EJ analysis the Staff should have first predicted the difference in impacts between the low-income elderly population and the general population and then made a determination of the significance of that difference.

**h. Hispanic Residents Would Suffer Even Greater Disparate Impact Due to Greater Communication Difficulties**

To illustrate potential impacts upon the Hispanic community, Clearwater presented testimony from Ms. Guardado, a Hispanic resident who lives in Peekskill. Ms. Guardado, provided her testimony at the evidentiary hearing with the help of an interpreter, because of her limited fluency in English. Tr. at 2840:8-16. She stated that disparate impacts could arise from the language barrier, in addition to this community's heavy reliance on public transportation. Exhibit CLE08 at A15 & A17. We have already discussed the latter issue above and need not discuss it further here.

With regard to the language barrier, Ms. Guardado testified that that like many Hispanic residents she speaks primarily Spanish and has limited ability to understand English. Id. at A5 to A6. In case of an emergency evacuation, Ms. Guardado stated that this language barrier might give rise to difficulties and misunderstandings potentially delaying the evacuation of this group.

Id. at A.14. For instance, she argued that, if during an emergency evacuation there are no Spanish speaking officials there is a likelihood that this community might not learn on time what to do or where to go to escape danger and meet their loved ones or learn the whereabouts of their children. Id. Ms. Guardado added that the Hispanic community's potential inability to properly communicate in English could be further exacerbated by the existence of a radiological threat further reducing the possibility of getting accurate answers and understanding them. Tr. at 2843:7-19. This, she argued, would create a scenario of panic, frustration, and chaos, potentially delaying this community's evacuation and adding complexity in dealing with this EJ population during an already stressful process. Exhibit CLE08 at A.16.

Ms. Guardado testified that further complicating this pre-emergency vulnerability (language barrier) is the lack of access to emergency management materials in Spanish. To this regard, Ms. Guardado testified that, even though, she is deeply involved in the Hispanic community of Peekskill she had not, until becoming involved in this proceeding, accessed an Indian Point evacuation plan. Exhibit CLE08 at A.12. Furthermore, during the evidentiary hearing Ms. Guardado testified that even after learning of the existence of such a document in Spanish she has not been able to get hold of a copy. Tr. at 2845:9-2846:6. Notably, although Entergy showed that Spanish language documents are available, it has not studied whether they are actually reaching the Hispanic community. Tr. at 2899:20-2900:4.

We find that Clearwater's testimony shows that the language barrier would be yet another potential source of greater adverse impact for the Hispanic community in addition to other factors common to other minority groups. The limited ability of many Hispanic residents to speak English would likely impair their ability to understand instructions regarding evacuation, bus provision, and family reunification. This could lead to higher radiation doses in an accident

scenario. We are not persuaded that the mere existence of Spanish language documents negates this disparate impact. Such documents could reduce disparate impact, if they reach local Hispanic residents, but Clearwater's uncontradicted evidence is that few residents are aware of them. Therefore, the NRC must first identify the potential for disparate impact upon Hispanic residents and assess its significance in the revised analysis of EJ impacts.

## **CONCLUSIONS OF LAW**

### **1. Legal Requirements of NEPA**

#### **a. NEPA Requires a Hard Look at Environmental Impacts to Determine Their Significance**

NEPA establishes a “national policy to encourage productive and enjoyable harmony between man and his environment.” *Dep’t of Transp. v. Pub. Citizen*, 541 U.S. 752, 756 (2004) (quoting 42 U.S.C. § 4321 (2011)) (internal citations and quotations omitted). It was created to reduce or eliminate environmental damage and “to promote the understanding of the ecological systems and natural resources important to the United States.” *Id.* (internal citations and quotations omitted). NEPA requires federal agencies to examine the environmental consequences of their actions before taking those actions, in order to ensure “that important effects will not be overlooked or underestimated only to be discovered after resources have been committed or the die otherwise cast.” *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989). The purposes of the statute are (1) to ensure that the agency will have and consider detailed information concerning “every significant aspect of the environmental impact of a proposed action,” *Balt. Gas & Elec. Co. v. Nat’l Res. Def. Counsel, Inc.*, 462 U.S. 87, 97 (1983), and (2) to ensure that the public can both contribute to the body of information and can access the information that is made public. *See Dep’t of Transp.*, 541 U.S. at 768; *San Luis Obispo Mothers For Peace v. NRC*, 449 F.3d 1016, 1020 (9th Cir. 2006).

One important question an agency must address under NEPA “is whether a proposed project will ‘significantly affect’ the environment.” *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1212 (9th Cir. 1998); 42 U.S.C. § 4332(2)(C). If the agency determines that a proposed action will have any significant effect on the environment, the agency must thoroughly study the effects through an EIS. *See id.* An agency may only make a determination that its proposed action will not have a significant effect on the environment after studying multiple factors. *Blue Mountains Biodiversity Project*, 161 F.3d at 1212 & n.5 (emphasis added). The two overall factors are context and intensity. 40 C.F.R. § 1508.27(a), 1508.27(b). One of ten sub-factors relating to intensity is whether the action threatens to violate government requirements for environmental impact. 40 C.F.R. § 1508.27(b)(10). But the agency must also consider the context and the nine other factors that relate to intensity, such as “[t]he degree to which the proposed action affects public health and safety,” the extent to which the action will be highly controversial, and “the degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks,” among others. 40 C.F.R. § 1508.27(a), (b)(2), (b)(4), & (b)(5). Only after considering each factor may an agency determine that the proposed action will have no significant effect on the environment. *See Blue Mountains Biodiversity Project*, 161 F.3d at 1212 & n.5.

In addition to considering the factors which determine whether an impact will be significant, the agency “must supply a convincing statement of reasons to explain why a project’s impacts are insignificant.” *Cntr. for Biological Diversity v. Nat’l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1220 (9th Cir. 2008) (internal quotations omitted). “The statement of reasons is crucial to determining whether the agency took a ‘hard look’ at the potential environmental impact of a project.” *Id.* (internal quotations omitted).

The Commission, in addressing environmental justice issues under NEPA, stated, “[t]he NRC’s goal is to identify and adequately weigh, or mitigate, effects on low-income and minority communities that become apparent only by considering factors peculiar to those communities.” *La. Energy Servs.*, 47 N.R.C. at 100. By doing so, the NRC is better able to “help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment.” *Dep’t of Transp.*, 541 U.S. at 769.

**b. Federal Agencies Must Document That They Have Taken a “Hard Look” at the Environmental Impacts of Proposed Action and Alternatives to the Proposed Action, Including Feasible Mitigation.**

NEPA mandates that federal agencies involved in activities that may have a significant impact on the environment complete a detailed statement of the environmental impacts and project alternatives. Specifically, for every major action significantly affecting the quality of the human environment, the NRC must provide a detailed statement by the responsible official on

- (i) the environmental impact of the proposed action,
- (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
- (iii) alternatives to the proposed action,
- (iv) the relationship between local short-term uses of man’s environment and the maintenance and enhancement of long-term productivity, and
- (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

42 U.S.C. § 4332(c). This “action-forcing” requirement for preparation of an Environmental Impact Statement (“EIS”), which assesses the environmental impacts of the proposed action and alternatives, is the primary method by which NEPA ensures that its mandate is met. *See Robertson*, 490 U.S. at 348. The EIS must be searching and rigorous, providing a “hard look” at

the environmental consequences of the agency's proposed action. *Id.* at 350; *Marsh v. Or. Nat'l Resources Council*, 490 U.S. 360, 373-74 (1989).

**i. The EIS Must Contain a High Quality Analysis of Severe Accident Impacts**

As a matter of law, severe accidents are covered under NEPA. The EIS must consider “reasonably foreseeable” impacts which have “catastrophic consequences, even if their probability of occurrence is low.” 40 C.F.R. § 1502.22(b) (2011). Probability is the “key” to determine whether an impact is “reasonably foreseeable” or whether it is “remote and speculative” and therefore need not be considered in an EIS. *Vt. Yankee Nuclear Power Corp.* (Vermont Yankee Nuclear Power Station), CLI-90-7, 30 N.R.C 29, 44 (1990) (citing *Limerick Ecology Action, Inc. v. NRC*, 869 F.2d 719, 739 (3d. Cir. 1989)). Applicants must “examine and evaluate the consequences of severe accidents in both the AEA (safety) and NEPA (environmental) context.” *Progress Energy Fla., Inc. (Levy Cnty. Nuclear Power Plant, Units 1 and 2)*, ASLB-52-029-COL, 52-030-COL, 69 N.R.C. 736, 107 (July 8, 2009), *aff'd in part, rev'd in part on other grounds*, in *Progress Energy Fla., Inc. (Combined License Application, Levy Cnty. Nuclear Power Plant, Units 1 and 2)*, CLI-10-02 (January 7, 2010) (internal quotations omitted). On the issue of terrorism, the Ninth Circuit found it had to be assessed, but the Third Circuit disagreed. *San Luis Obispo Mothers For Peace*, 449 F.3d at 1035 *contra N.J. Env'tl. Prot. v. NRC*, 561 F. 3d 132, 141-42 (3d Cir. 2009).

The analyses of impact must contain “high quality” information and “accurate scientific analysis.” 40 C.F.R. § 1500.1(b) (2011); *Sierra Club v. Marita*, 46 F.3d 606, 621 (7th Cir. 1995); *House v. U.S. Forest Serv., U.S. Dept. of Agric.*, 974 F. Supp. 1022, 1035 (E.D. Ky. 1997). Therefore, “[g]eneral statements about ‘possible’ effects and ‘some risk’” are inadequate unless there is a good reason why better information cannot be obtained. *Neighbors of Cuddy Mountain*

*v. U.S. Forest Serv.*, 137 F.3d 1372, 1380 (9th Cir. 1998); *see Tex. Comm. on Nat'l Res. v. Van Winkle*, 197 F. Supp. 2d 586, 619 (N.D. Tex. 2002). Similarly, the analysis cannot be based on “incorrect assumptions or data.” *Native Ecosys. Council v. U.S. Forest Serv.*, 418 F.3d 953, 964 (9th Cir. 2005); *see also* 40 C.F.R. § 1500.1(b) (2011). Moreover, the NRC Staff must “independently evaluate and be responsible for the reliability of all information used in the draft environmental impact statement.” 10 C.F.R. § 51.70(b) (2011).

**ii. The EIS Must Analyze Reasonable Alternatives to the Proposed Action and Explain the Agency’s Reasons for Accepting or Rejecting Them.**

After taking a hard look at the impact of a proposed action, federal agencies must analyze all feasible *alternatives* and explain the bases for their acceptances or rejection. *See* 40 C.F.R. §§ 1503.4, 1505.1(e) (2011). NRC regulations implementing NEPA require the NRC to consider alternatives to its licensing actions that may have detrimental effects on the environment. *See* 10 C.F.R. § 51.71(d) (2011).

These regulations are guided largely by NEPA §§ 102(2)(C)(iii), (E). NEPA § 102(2)(C)(iii) *requires* federal agencies, “to the fullest extent possible,” to “include in every recommendation or report on proposals for... major Federal actions significantly affecting the quality of the human environment” a detailed statement on “alternatives to the proposed action.” 42 U.S.C. § 4332(C)(iii); *Pa’ina Hawaii. LLC* (Materials License Application), CLI-10-18, 2010 WL 2753784 (N.R.C. July 9, 2010), at \*8. The agency must use its EIS to “rigorously explore and objectively evaluate *all* reasonable alternatives.” *Pa’ina Hawaii*, 2010 WL 2753784 at \*9 (internal citations omitted) (emphasis added). NEPA § 102(2)(E) creates additional requirements, mandating that federal agencies “study, develop, and describe appropriate alternatives to recommend courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.” 42 U.S.C. § 4332(E).

An analysis of reasonable alternatives includes an analysis of alternative sites for the proposed action. *The Commission explored these requirements in Pa'ina Hawaii.* In that case, Concerned Citizens argued that the Staff, in its final EA, failed to consider sites that would “avoid or minimize the environmental risks from weather, earthquake, and terrorist acts.” *Pa'ina Hawaii*, 2010 WL 2753784 at \*3. The Commission held:

[R]easonable alternatives must be considered as appropriate, and an explanation provided for their rejection. Patently, the identified purpose of the proposed irradiator reasonably may be accomplished at locations other than the proposed site. Therefore, the Board's decision to require the consideration of alternative sites is reasonable . . . .

*Id.* at \*12. While the Board emphasized that Pa'ina didn't yet have a lease for the proposed site, and that Pa'ina had itself considered alternative sites, neither of these facts was dispositive, and the analysis rested on the fact that viable alternative locations existed. *Id.*

In accordance with the principles of burden of proof discussed earlier, the agency bears the burden of *identifying* such sites. The Commission rejected Pa'ina's argument that Concerned Citizens did not “carry its burden of stating and supporting any valid contention” because they did not identify alternative, viable sites. *Id.* at 13 (emphasis in original). The Commission held, “this argument ignores the fact that [. . .] the primary obligation of satisfying the requirements of NEPA rests on the agency.” *Id.*

Considering alternatives in one domain does not exempt the agency from considering substantially different alternatives in another. In *Pa'ina Hawaii*, the Commission rejected the Staff's contention that it need not consider alternative sites since it had already considered alternative technology. The Commission held that it was “not clear error for the Board to require the Staff to consider alternative sites in this particular proceeding” because “in this case alternative sites are ‘significantly distinguishable’ from the alternative technologies the Staff

considered” and might have consequences that are not “substantially similar” to those alternatives considered. *Id.* The Commission also highlighted the importance of a detailed explanation, stressing that the requirement for full consideration is even greater under an EIS than under an EA. *Id. at 9.* Thus, under NEPA, the EIS must contain an analysis of all reasonable alternatives and an explanation for the acceptance or rejection of each alternative.

**iii. The EIS Must Analyze Feasible Mitigation Measures to Reduce Impacts From Severe Accidents and Explain the Agency’s Reasons for Accepting or Rejecting Them.**

The analysis of alternatives includes an analysis of measures that can mitigate the effects of severe accidents. The NRC defines “severe accidents” as “reactor accidents more severe than design basis accidents and those in which substantial damage is done to the reactor core whether or not there are serious offsite consequences.” *Progress Energy Fla., Inc.* (Levy Cnty. Nuclear Power Plant, Units 1 and 2), ASLB-52-029-COL, 52-030-COL, 69 N.R.C. 736, 106 (July 8, 2009), *aff’d in part, rev’d in part on other grounds*, in *Progress Energy Fla., Inc.* (Combined License Application, Levy Cnty. Nuclear Power Plant, Units 1 and 2), CLI-10-02 (January 7, 2010) (internal quotations omitted). Severe accident mitigation design alternatives (“SAMDAs”) are “possible plant design modifications that are intended not to prevent an accident, but to lessen the severity of the impact of an accident should one occur.” *See Limerick*, 869 F.2d at 731. Severe Accident Mitigation Alternatives (“SAMAs”) are “plant modifications or procedure changes that do not necessarily prevent severe accidents but reduce the offsite consequences or severity of the impact should a severe accident occur.” Nuclear Energy Institute (Receipt of Petition for Rulemaking), 1999 WL 739640, at \*4 (N.R.C. August 27, 1999). This analysis is inherently a part of the impact analysis because mitigation alternatives can lower the impact of the proposed action.

In *Progress Energy*, the ASLB specified that NEPA and NRC regulations require consideration of measures to mitigate environmental impacts: “In the environmental context, NEPA § 102(2)(C) ‘implicitly requires agencies to consider measures to mitigate [environmental] impacts.’” *Id.* at 107-08 (quoting Nuclear Energy Institute; Denial of Petition for Rulemaking, 66 Fed. Reg. 10,834, 10,836 (Feb. 20, 2001)). Council on Environmental Quality (“CEQ”) regulations elaborate, defining the term “mitigation,” and requiring that the EIS include appropriate mitigation measures. *See* 40 C.F.R. §§ 1508.20, 1502.14(f), and 1502.16(h). NRC regulations follow suit, requiring that the ER include an analysis of the “alternatives available for reducing or avoiding adverse environmental effects.” 10 C.F.R. § 51.45(c). In addition, the ER associated with each application for a standard design certification must address the costs and benefits of SAMDAs. 10 C.F.R. § 51.55(a).

The treatment of SAMDAs illustrates how consideration of mitigation measures should be integrated into the NEPA process. The court in *Limerick* found that Staff must address SAMDAs in a report prior to or at the licensing hearing unless the NRC (1) makes a rulemaking that environmental effects need not be considered or (2) specifically rejects consideration of SAMDAs in a policy statement establishing that consideration of SAMDAs could not affect the final decision. *See Limerick*, 869 F.2d at 741. When the agency addresses SAMDAs in its Final Environmental Statement, the report must contain “sufficient discussion of the relevant issues and opposing viewpoints to enable the decision maker to take a ‘hard look’ at the environmental factors and to make a reasoned decision. . . . The impact statement must be sufficient to enable those who did not have a part in its compilation to understand and consider meaningfully the factors involved.” *Id.* at 737 (internal citations and quotations omitted).

In *Limerick*, the NRC did not consider SAMDAs in the Final Environmental Impact Statement. Rather, the Commission addressed SAMDAs through a policy statement. The court held that this did not satisfy NEPA because (1) the environmental statement itself was defective, and (2) the policy statement was an inadequate substitute. *Id.* at 731-32. First, the court held that the environmental statement was defective because the NRC neither considered nor specifically rejected SAMDAs. *Id.* Furthermore, the policy statement did not overcome the failures of the environmental statement because it did not carefully consider environmental consequences and excluded consideration of design alternatives without making any conclusions about their effectiveness. *Id.* at 736-37. Finally, it was not sufficiently specific, since issues were not generic in that the impact of severe accident mitigation design alternatives on the environment would differ with each particular plant's design, construction and location. *Id.* The court concluded that both the FEIS and the Final Policy Statement were inadequate, since neither provided support for the exclusion of SAMDAs.

## **2. NRC Requirements Regarding Environmental Justice Under NEPA**

NEPA requires agencies to examine the environmental justice implications of their actions. Executive Order 12898 directs Federal executive agencies to consider environmental justice under NEPA. Executive Order 12898, 59 Fed. Reg. 7629 (Feb. 11, 1994). While the Order is not formally binding, the NRC has interpreted the order to clarify obligations under NEPA to examine environmental justice contentions, NRC EJ Policy Statement, 69 Fed. Reg. at 52048, and then-Chairman Selin indicated that the NRC would carry out the measures in the Executive Order. *See* Letter to President from NRC Chairman Ivan Selin (Mar. 31, 1994). In August 2004, the NRC issued an EJ Policy Statement reaffirming its obligation to consider the environmental impacts on environmental justice communities associated with the agencies proposed action. NRC EJ Policy Statement, 69 FR at 52,044. Though the NRC EJ Policy

Statement itself is not formally binding on either the agency or the public, *see Dominion Nuclear North Anna* (Early Site Permit for N. Anna ESP Site), CLI-07-27, 66 N.R.C. 215, 240 (Nov. 20, 2007), the Policy Statement makes clear that the NRC is obligated to meet its NEPA obligations, which it interprets to include environmental justice issues. NRC EJ Policy Statement, 69 Fed. Reg. at 52046-47.

**a. NRC Advances Environmental Justice Through Disparate Impact Analysis Carried Out on a Site-Specific Basis.**

The NRC's recognition that environmental justice is a site-specific issue is reflected in regulations stating that the Generic Environmental Impact Statement does not assess environmental justice impacts at all, 10 C.F.R. Part 51, Sub-part A, Appendix B, FN 6 (2011) ("Environmental Justice was not addressed in NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," because guidance for implementing Executive Order 12898 issued on February 11, 1994, was not available prior to completion of NUREG-1437. This issue will be addressed in individual license renewal reviews."). This is also recognized in regulations regarding the potential impacts of decommissioning nuclear power plants. NUREG-0586 Supplement 1, Vol. 1 (Nov. 2002) at 4-65 (explaining that the NRC has a legal obligation to make site-specific environmental justice assessments of the potential impacts of decommissioning nuclear power plants). Moreover, the policy of providing a site-specific environmental justice analysis is discussed in the FSEIS. *E.g.* FSEIS at A-117.

The NRC's case law has made clear that "[d]isparate impact' analysis is [its] principal tool for advancing environmental justice under NEPA." *Claiborne*, 47 N.R.C. at 100. According to *Claiborne*, the seminal NRC decision on environmental justice, "[t]he NRC's goal is to identify and adequately weigh, or mitigate, effects on low-income and minority communities *that become apparent only by considering factors peculiar to those communities.*" *Id.* (emphasis

added). This standard makes clear that the only way for the NRC to properly assess the environmental justice effects on local communities of minority and low-income people is by looking closely at the peculiar characteristics of the communities that will make any adverse environmental effects disproportionately difficult for them.

In *Claiborne*, Louisiana Energy Services, L.P. (“LES”) sought to build a uranium-enrichment facility on a site in Claiborne Parish, Louisiana that was immediately adjacent to and between two African-American communities. *Id.* at 83. Citizens Against Nuclear Trash (“CANT”) intervened in the proceedings of the NRC, alleging, among other things, that LES’s Environmental Report did not adequately address the environmental justice concerns of the surrounding communities, which were 97% African-American and were two of the poorest and most disadvantaged communities in the United States. *See id.*

Building this facility, the Claiborne Enrichment Center (“CEC”) would likely have required a relocation of Parish Road 39, which was a major link between the two communities surrounding the proposed site. *Id.* at 106-7. The record showed that relocating the road would be a minor inconvenience for drivers, but would pose a significant burden for pedestrians. *Id.* at 107. In its review, the Commission agreed that the FEIS did not adequately address the CEC’s disparate impacts of relocating Parish Road 39 because it only examined the impact of the relocation on drivers. *Id.* at 108. In coming to this conclusion, it looked at the specific characteristics of the particular minority and low-income communities surrounding the proposed site; many members of the highly impoverished communities had no means of transportation other than walking, and adding an extra .38 mile to the commute each way would be especially difficult for the elderly and infirm local residents. *Id.* at 107. Without recognizing that low car ownership was a factor in this community, the environmental analysis for LES was unable

adequately to identify or weigh the disparate impacts that would have been caused by building the CEC on the local low-income and minority populations. *Id.* at 107-08.

**b. The Commission’s Own Guidance Provides a Rational Approach for Conducting an Effective Site-Specific Environmental Justice Analysis.**

According to the Policy Statement and case law, environmental justice reviews comprise two major steps: (1) identifying minority and low-income populations that the proposed action could potentially impact, NRC EJ Policy Statement, 69 Fed. Reg. at 52084, and (2) disclosing any disproportionately high and adverse impacts to these particular populations that, due to the population’s unique characteristics, may differ from the impacts to the general population. *See Claiborne*, 47 N.R.C. at 100. This approach should be flexible and supplemented by the EIS scoping process to ensure minority or low income groups are properly identified. NRC EJ Policy Statement 69 Fed. Reg. at 52084. If potentially affected minority or low-income communities are present, the Commission requires the NRC Staff “(1) [t]o identify and assess environmental effects on low-income and minority communities by assessing impacts peculiar to those communities; and (2) to identify significant impacts, if any, that will fall disproportionately on minority and low-income communities.” NRC EJ Policy Statement, 69 Fed. Reg. at 52048.

**i. The First Step in an EJ Assessment is to Identify EJ Populations and Factors Peculiar to These Communities**

The first step involves identifying minority and low-income populations that the proposed action could potentially impact, with the recognition that “numeric criteria are guidance – a starting point – for staff to use when defining the geographic area for assessment” and that NRC staff analysis should also include “the identification of EJ concerns during the scoping process.” *Id.* at 52046. Population statistics are used within the geographic area to identify potentially affected low-income and minority communities. *Id.* at 52047-8. For licensing and regulatory actions involving power reactors, the geographic area for assessment

typically encompasses a 50-mile radius from the site. *Id.* This is a flexible measurement, guided in each case by the potential impact of the proposed action. *Id.* at 52048. Once the area is defined, the NRC staff must identify potentially affected low-income and minority communities within it:

[A] minority or low-income community is identified by comparing the percentage of the minority or low-income population in the impacted area to the percentage of the minority or low-income population in the County (or Parish) and the State. If the percentage in the impacted area significantly [by at least 20 percentage points] exceeds that of the State or the County percentage for either the minority or low-income population then EJ will be considered in greater detail. [. . .] Alternatively, if either the minority or low-income population percentage in the impacted area exceeds 50 percent, EJ matters are considered in greater detail.

*Id.* As already stated, the purpose of an environmental justice analysis, “is to identify and adequately weigh, or mitigate, effects on low-income and minority communities *that become apparent only by considering factors peculiar to those communities.*” *Claiborne*, 47 N.R.C. at 100 (emphasis added). *Private Fuel Storage* (Indep. Spent Fuel Storage Installation), *L.L.C.*, CLI-02-20, 56 N.R.C. 147 (Oct. 1, 2002), underscores the importance of this inquiry into a community’s specific characteristics, noting that “[e]nvironmental justice, as applied at the NRC, . . . means that the agency will make an effort under NEPA to become aware of the demographic and economic circumstances of local communities where nuclear facilities are to be sited, and take care to *mitigate or avoid special impacts attributable to the special character of the community.*” *Private Fuel Storage*, 56 N.R.C. at 156.

The standards presented in these cases show clearly that an essential part of properly completing step one, identifying environmental justice populations, involves taking into consideration the specific characteristics that would make the local minority or low-income population vulnerable to disparate impacts. Only then can one attempt step two.

**ii. The Second Step in an EJ Assessment is to Predict Disparate Impact Taking Account of the Peculiar Factors.**

The second step of the analysis is to determine whether the peculiar factors of a community give rise to disparate impacts. Disparate impacts the NRC is concerned with are those “adverse impacts that fall heavily on minority and impoverished citizens.” *Claiborne*. at 106. The Staff must give these disparate impacts “particularly close scrutiny.” *Id.*

**iii. The Third Step in an EJ Assessment is to Consider Mitigation and Feasible Alternatives**

Finally, the third step of the analysis requires the Staff to consider how to mitigate the disparate impacts of the proposed action and any feasible alternatives, whether or not mitigation measures are within the Staff’s control. NEPA and the NRC’s case law make clear that the NRC has an affirmative duty to mitigate adverse actions in its environmental justice analysis. Indeed, the NRC has stated that “[it] expect[s] NRC EISs, and presiding officers in adjudications, to inquire whether a proposed project has disparate impacts on ‘environmental justice’ communities and whether and how those impacts may be *mitigated*.” *Hydro Res., Inc.*, CLI-02-20, 53 N.R.C. 31, 64 (Oct. 1, 2001) (internal quotations omitted).

**3. NRC’s Environmental Justice Analysis Failed to Satisfy NEPA or the NRC Guidance.**

**a. The Generic Finding of SMALL Impacts for a Severe Accident is Irrelevant.**

Entergy and the Staff assert that because the generic EIS found no significant risk of accident from continued operation of *all* nuclear plants, no environmental justice population near Indian Point will experience significant and disproportionate harm from its relicensing. Entergy SoP at 3-4; *see also* NRC Staff SoP at 15-16 (“[T]he Commission has generically determined that the probability weighted impact risks associated with severe accidents are small. Therefore, there is no disproportionately high or adverse impact on minority or low-income populations.”

(internal citations omitted)). This position is fallacious, because the focus in the EJ analysis is on the difference between the impact on the general population and the impact in the EJ population. The NRC Staff acknowledged as much at the hearing, stating that the EJ impacts could be significant even if the impact on the general population is small. Tr. at 2757:12-2758:3. Furthermore there is no regulation exempting the EJ analysis from the need to consider severe accidents. Tr. at 2758:7-13. Similarly, Entergy also admitted that an environmental justice review under NEPA requires “disclosing any disproportionately high and adverse impacts to [environmental justice] populations that, due to the population’s unique characteristics, *may differ from the impacts to the general population.*” Entergy SoP at 16. A finding about the general population tells us nothing about these differing impacts.

A generic determination of the impacts of severe accidents on the general population, therefore cannot substitute for the required site- and population-specific analysis of *disproportionate* impacts resulting from specific factors that are not shared by the general population, which were admittedly not examined in the GEIS. *See* NRC Staff SoP at 6; Entergy SoP at 17. Relying on the generic analysis is therefore not an appropriate environmental justice analysis and does not satisfy NEPA. *See Dominion Nuclear North Anna, LLC*, 66 N.R.C. at 243-47 (noting that cursory regurgitation of prior EIS findings in lieu of detailed environmental justice analysis is not justified as a concise presentation, but upholding staff review on other grounds).

NEPA plainly requires a thorough examination of disproportionate and adverse impacts to identified environmental justice populations. The prior determination of SMALL risk in the GEIS does not relieve the NRC of these NEPA obligations in relicensing proceedings. Further investigation of disproportionate harm to environmental justice populations is still required.

**b. NRC Failed to Conduct an Independent Assessment of the Existing Emergency Plans**

NEPA requires that the NRC make an “independent assessment” of the environmental impacts of relicensing Indian Point. *Progress Energy Fla., Inc. (Levy Cnty. Nuclear Power Plant, Units 1 and 2)*, LBP-11-01 (Feb. 2, 2011) (slip op. at 5-6) (citing *La. Energy Servs., L.P. (Nat’l Enrichment Facility)*, LBP-06-8, 63 N.R.C. 241, 259 (Mar. 3, 2006) (internal citations omitted)). In drafting an EIS, the NRC is entitled to rely on “data, analyses, or reports prepared by . . . competent and responsible state authorities,” but only if the NRC conducts an independent evaluation of the external information on which it relies. *Id.* at 5 n1. NEPA does not require the NRC to duplicate a current and sound environmental analysis conducted by another agency, but it does require the NRC to find such external sources “relevant” and “scientifically reasonable” through its own independent evaluation and take responsibility for the information contained therein. *Id.*; *La. Energy Servs.*, 63 N.R.C. at 259; 10 C.F.R. § 51.70(b); see *Calvert Cliffs’ Coordinating Comm., Inc. v. AEC*, 449 F.2d 1109, 1116 (D.C. Cir. 1971) (“[T]he Commission’s regulatory staff must take the applicant’s report and prepare *its own* ‘detailed statement’ of environmental costs, benefits and alternatives”) (emphasis added).

It is the NRC’s contention that the environmental justice analysis conducted by its staff adequately meets the “hard look” standard under NEPA, and sufficiently addresses environmental impacts of license renewal on minority and low-income populations near Indian Point. NRC Staff SoP 10. But the NRC’s NEPA obligations are not satisfied by conclusory statements about the existence and adequacy of other entities’ emergency plans. See *Progress Energy Fla., Inc.*, slip op. at 6-7, 18-19. Relying too heavily on externally produced information can be and is fatal to the EIS. See *id.* at 19.

With regard to emergency plans for the environmental justice population housed at Sing Sing, the NRC Staff has relied on New York State's assessment of its ability to evacuate the prison. This reliance does not constitute the required independent analysis of potential disparate impacts at Sing Sing on the part of the NRC and does not satisfy NEPA. Furthermore, the factual evidence presented by Clearwater strongly suggests that New York State's confidence that Sing Sing could be evacuated fast enough to meet the EPA guidance on radiation exposure could be misplaced. At minimum, the Staff must make an assessment of this issue taking account of multiple opinions, not just the single opinion providing the answer that the Staff would like to hear.

**c. The Staff Should Identify the Differential Impacts of Severe Accidents on EJ Populations**

Having concluded that as a matter of law the Staff erroneously excluded the site specific impact of severe accidents from the EJ analysis, it follows that the Staff must analyze those impacts. While these effects are not new, we further find that NEPA requires the Staff to compare the effect of the proposed action, license renewal, with the effect of the no-action alternative, which is closure of the plant. Therefore, the Staff should look at accident conditions and whether the existing operation is causing disparate impact. The Staff must carefully follow the NRC guidance and should not limit its analysis to the block group level where unidentified peculiar factors could be present. Instead, it must examine the nature of the identified populations and what peculiar factors are present. It must then consider whether these peculiar factors could give rise to a difference in impact. Where the Staff identifies a difference in impact, it must then determine if it is significant. As the Staff admitted at the hearing, it has not studied accident impacts on EJ populations except for its testimony at the hearing, which was

limited to radiation impacts at Sing Sing prison. These gaps must be closed before the Staff can endorse extending the operational life of Indian Point.

More specially, for “special populations” in institutions containing EJ populations (“EJ Institutions”) one special-factor is that they cannot self-evacuate. Therefore, unlike the general population, extended shelter-in-place is the planned primary response for populations in EJ Institutions. According to the EPA guidance, which are used for emergency planning purposes, that they could be exposed to twice as much radiation as the general public. In addition, they be exposed to extreme cold or heat if the heating, cooling, and ventilation systems are turned off while they are sheltering-in-place. The institutions may also lack attendants if many of them evacuate with the general population. While determining which of the many of institutional populations qualify as EJ populations may be a difficult task, Entergy’s identification of 67 correctional institutions within the 50 mile radius illustrates that it is not impossible.

Breaking this category down further, there are many other unique factors to consider. For example, prisoners in EJ Institutions may be exposed to violent disorder during an accident. Elderly people in EJ Institutions may become separated from their medications and may need assistance to board transportation. The Staff must reach an independent conclusion about the difference in impact between various institutional EJ populations and the general public.

Non-institutionalized EJ populations have various other peculiar characteristics. For example, may low income, mainly minority, residents lack personal vehicles and are dependent on buses. It is undisputed that these populations will have to wait at bus stops in the open air while the general population is either sheltering or using personal vehicles to evacuate. It is inevitable therefore that these populations will receive a higher doses than the general population because they will be exposed to radiation for longer. In addition, due to lack of private vehicles

and health insurance, EJ populations will have less access to medical care both during an accident and for follow up thereafter.

Some Hispanic residents will also be subject to differential impact because communication difficulties will inevitably result from their lesser than average ability to communicate in English. This will lead to less availability of information. In addition, Clearwater's evidence demonstrated that many Spanish-speaking residents are unaware of the existence of Spanish language materials that Entergy has prepared. Furthermore, it is likely that during an evacuation, any first responders would communicate primarily in English. Thus, once again we find that it is inevitable that these populations would be disadvantaged relative to the general population during an accident, but it up to the Staff to assess whether the difference is significant.

Other EJ communities may be at a differential disadvantage because of their geographic setting. For example, Clearwater has shown that the town of Peekskill near the plant suffers from a lack of physical access in general. This lack of physical access may exacerbate other factors such as lack of access to personal vehicles. On a wider scale this issue may also apply to areas of the Bronx that have limited east-west transportation options and an unusually high density of residents. Furthermore, although the NRC Staff has suggested that an evacuation could be organized on an ad hoc basis for these residents we give greater credit to statements stating that such ad hoc approaches would be unlikely to be successful. Once again, instead of taking an optimistic point of view, the Staff should take a realistic view. Based on realistic assumptions, the Staff should first assess the potential for disparate impact on EJ populations in specific geographical areas before it can decide if that difference is significant.

With regard to non-radiation impacts, Clearwater showed that the consequences of major catastrophes like the Fukushima accident and hurricane Katrina fall disproportionately on vulnerable communities like the elderly, the sick, the poor, and the incarcerated. While, these populations may not be directly included as EJ communities, they often qualify for EJ status by virtue of their low income, or in the case of the incarcerated, their minority status. Thus, the Staff must include non-radiation impacts in its new analysis.

**d. The Staff Must Take Into Account All Factors To Determine The Significance of Identified Disparate Impacts**

The evidence presented by Clearwater shows that an accident at Indian Point would probably cause disparate impacts in terms of both non-radiation and radiation impacts. With regard to radiation impacts, it is undisputed that “special populations” that are difficult to evacuate would likely receive higher doses of radiation than the general population. Some of these special populations are environmental justice populations, like the population of Sing Sing prison. The staff has sought to dismiss this difference as insignificant because it is within EPA guidance, but the regulations on NEPA significance show that a more detailed inquiry was needed, because there are multiple other factors that the staff failed to consider, such as how controversial the difference would be, the levels of uncertainty, whether the impacts are unique, and whether there is a danger to health. 40 C.F.R. § 1508.27. The Staff’s approach of relying solely on EPA guidance to find a lack of significance is plainly arbitrary.

Furthermore, this difference in exposure is controversial and could more than double the chances of radiation-induced cancer. In addition, although the Staff sought to reassure us that evacuation plans are in place, at minimum, Clearwater’s evidence showed that there is considerable uncertainty about whether they will be effective for prison populations. With regard to Sing Sing, the Staff must therefore make its own assessment of the evacuation plans

and then revisit its finding of lack of significance and taking into account all the factors set forth in the CEQ regulations. For other prison populations that may experience a disparate impact, the Staff should undertake a similar analysis.

We have also concluded that disparate radiation impacts are also likely for many EJ populations, including the elderly in EJ Institutions, transport-dependent populations, EJ populations residing in geographically isolated areas or particularly densely populated areas, and Hispanic residents. For all EJ populations that may experience a disparate radiation impact the Staff should assess the disparity for each population and then make a determination of significance.

The Fukushima accident showed that the non-radiation EJ impacts are potentially significant, because a serious nuclear accident can cause a disproportionate number of deaths among potential EJ populations due to various non-radiation effects, including stress, extremes of temperature, lack of attendants in institutions, and separation from essential medications. The Staff has not conducted any analysis of whether such an outcome would occur in the case of an accident at Indian Point. This is another gap that must be filled. After the Staff does this analysis it must then determine whether the difference in impact would be significant. As discussed above CEQ guidance requires consideration of many factors, not just whether NRC or EPA guidelines are being met. 40 C.F.R. § 1508.27.

In the case of non-radiation impacts at penal institutions, Clearwater's evidence raised the question of whether potential or actual radiation exposure could lead to prison unrest, especially after the general population evacuates. In response, the Staff quoted the opinions of a New York State prison official that this would not occur. However, as already discussed, the Staff made no independent assessment of whether prison unrest could occur. Instead it has merely repeated the

opinion of a New York State official. As discussed above,, this is not permissible. Therefore, further study is required on this point.

Finally, while the Staff and Entergy pointed out that there are already plans, laws and regulations in place designed to mitigate the effects of an accident, the Staff cannot assume that everything will go according to plan. Instead, the Staff should look to real world experience to make realistic assumptions about what would happen in reality. Once again, we emphasize that the Staff should not second guess emergency planning regulations, instead, it should make a realistic estimate of EJ impacts that a severe accident would cause given the existing emergency plans.

**e. The Staff Must Examine Mitigation Measures Where EJ Impacts Are Significant**

It is black letter NEPA law that the Staff must examine feasible mitigation measures for differential impacts that it finds such impacts to be significant. Many such measures have been suggested by Clearwater, ranging from evacuation planning for EJ populations beyond the 10 mile EPZ to filtering of ventilation systems for nearby institutions. We note that some of the measures suggested are simple and cost little. For example, having those who do not have personal transportation could assemble at a public building like a school or administration building rather than wait at the side of the road. This seems like a reasonable way to minimize differential exposure for this sub-population, even if the Staff ultimately finds that the dose differential is not significant. Therefore, we trust that the NRC Staff will examine the full range of mitigation measures and highlight those which could easily be implemented, even if they are not essential to license renewal.

## CONCLUSION

The evidence in this case has demonstrated that the EJ analysis for Indian Point fails to provide a sufficiently detailed site-specific analysis of the potential for the relicensing of the reactor to cause disproportionate impacts on local EJ populations and arbitrarily dismissed proven disparate impacts upon prisoners at Sing-Sing as insignificant. Therefore, the relicensing of Indian Point cannot proceed unless and until the NRC Staff amends the FSEIS to include the required analysis, which should include an assessment of the significance of the expected higher adverse impacts on environmental justice populations during an accident.

Respectfully submitted,

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