U.S. EPA Specific Comments on the Draft Environmental Impact Statement for the License Renewal of the Columbia Fuel Fabrication Facility, Richland County, South Carolina.
Docket ID NRC-2015-0039, CEQ #20210108

1. The Draft Environmental Impact Statement (DEIS) section (2.2.2.1.2) "Environmental Monitoring Program" mentions the monitoring frequency of well water and river water sites. Such monitoring is generally performed quarterly and/or annually. We are concerned particles or contaminates may move faster and may not be clearly represented in the sampling/monitoring of the site. We recommend that the Final EIS re-evaluate the monitoring frequency to ensure that the sampling intervals are appropriate and are more representative for the fate transport of contamination.

2. The closest down-gradient public works system (PWS) well is at the Congaree National Park. While this is 6.5 miles away from CFFF and it is unlikely that any contaminants would reach this well, the U.S. Environmental Protection Agency (EPA) recommends that Columbia Fuel Fabrication Facility (CFFF) consider monitoring this well for radionuclides (uranium). It is unknown if the small PWS has regular radionuclide monitoring in its regular schedule.

3. Section 3.4.1 "Groundwater and Quality" state that there are four downgradient private water wells that are close to the site. We suggest that the CFFF continue regular monitoring of these wells. The EPA recommends ensuring that there is no confusion regarding potentially naturally occuring uranium in groundwater with the uranium that would be originating from the CFFF site. As a result, we suggest adding lines to the graphs with radionuclide concentrations and activities indicating regulatory limits (i.e., Maximum Contaminant Levels (MCLs)) in Figures. 3-9, 3-10, 3-11, 3-14, 3-17.

4. Many of the included maps and figures lack critical elements such as legends and/or scale bars (e.g., Fig 2-1, 2-2, 2-4, 2-7). Fig 2-10, while useful, has no orientation information. For Fig 3-8 the reader must assume that in the Plan View, up is North. For the maps and figures that are missing critical elements include updates in the Final EIS.

5. Significant uncertainties exist between the extent of the interchange between surface water and groundwater regarding the additional sources of future Technetium-99 (Tc) and Uranium (U) contamination. We recommend that the Final EIS state what criteria were used to justify a Small impact to surface water resources and a Small to Moderate impact to groundwater resources in the Final EIS.

6. It is unclear whether Westinghouse Electric Company, LLC (WEC) conducted a risk assessment to inform how contamination may affect populations surrounding the facility. We suggest that the U.S. Nuclear Regulatory Commission (NRC) consider completing a risk assessment that evaluates how contamination could potentially impact surrounding populations and summarize the findings in the Safety Evaluation Report as well as the Final EIS.

7. After the flooding events described in Section 2.1.3, "Facility Event and Changes Since 2007 License Renewal," the DEIS states that "No long-term impacts on groundwater wells within the existing monitoring well network and the water table on the bluff are anticipated because most of the rainfall left the site via overland flow in CFFF's network of stormwater ditches" (Page 2-9).

To support the statement above, we recommend that the Final EIS indicate whether measurement was taken of ether surface water or groundwater, and the Congaree River following previous flood events.

8. Section 2.2.2 “Facility Monitoring Program” describes the facility monitoring programs. It is unclear whether the wells used for groundwater sampling were characterized for the complete suite of water chemistry constituents (e.g., pH, cations, anions, etc.), and whether they have been or will be used as part of the conceptual site model to characterize migration of contaminants. If the wells have not been characterized with the complete suite of water chemistry, we recommend that that the CFFF characterize the well using the full suite of water chemistry to provide more accurate model results.

9. Section 2.2.2.2, “Monitoring of SCDHEC NPDES Permit” also describes sampling for multiple constituents including volatile organic carbons (VOCs), nitrate, fluoride, gross alpha, and gross beta. Under the current permit requirements, it is unclear whether there are any actions that need to be taken if samples exceed an EPA Maximum Contaminate Level (MCL) or some predetermined value. VOC degradation by soil microorganisms occurs at a very slow rate (Page 3-44), as does denitrification. The soils need to be characterized to determine if biodegradation processes are possible or dependable as remediation options. We recommend that the Final EIS provide a more in-depth discussion on VOCs to determine if statistically significant trends demonstrate an increase in contamination in the wells. We also recommend that the soils be characterized to determine if biodegradation processes are possible or dependable as remediation options.

10. Section 2.4.2 “License Renewal for 20 years”, page 2-26, suggests that uncertainties with a 20-year license renewal vs. a 40-year license renewal would be similar, though the extent of the impact would differ. Given that the environment in and around the facility has already seen a significant impact from past and ongoing operations, and the uncertainties involving the sources and migration of radionuclides, nitrate, fluoride, and VOC plumes, the difference between the extent of contamination between 20 and 40 years seems like it would be more significant than is being stated in the DEIS. We recommend that the Final EIS provide a discussion regarding how the cumulative effect may differ between the 20-year and 40-year permit options. We also recommend that monitoring continue on a quarterly basis along with annual reports that demonstrate the cumulative impacts for the 20-year verses the 40-year permits.

11. “Soils and Soils Impacts” Section 3.2.4, page 3-15 discusses the source of Tc-99 contamination as being unknown, but elsewhere in the DEIS, the source of Tc-99 is identified as historical U feed sources (pp. 3-40). We recommend that the Final EIS clarify this issue.

12. Section 3.3.1.1 “Congaree River”, the average discharge of Tc-99 is 4.9 mCi/year. With discharge to the river at 378,541 L/d, the daily discharge of Tc-99 is about 1.34E7 pCi/day or 35.5 pCi/L of the river. This 35.5 pCi/L is below the EPA Tc-99 MCL of 900 pCi/L. We recommend that the Final EIS clarify how CFFF could ensure that these concentrations stay below the stated values downstream from the facility over the next 20-40 years.

13. Based on the characterizations of gross alpha gross beta, nitrate, and fluoride concentrations, there seems to be a plume of contamination under CFFF possibly heading toward the Congaree River. We recommend that the Final EIS provide a more in-depth discussion on the potential plume and what steps are being taken to ensure that the plume is not discharged into the river between monitoring schedules.

14. Much of the nitrate is still in the groundwater while a lot of ammonia is in surface waters (Section 3.3.1.2, "On-site Surface Water and Floodplain", page 3-24). We recommend that the Final EIS provide a discussion on denitrification and soil partitioning and the potential cumulative impacts.

15. "In addition, the Congaree River is not impaired downstream of the CFFF discharge by any identified COPCs attributed to CFFF operations" (Section 3.3.2.1, "Congaree River" page 3-25). We recommend that the Final EIS provide additional map(s) and discussions on downstream sampling.

16. "No porosity data for the surficial aquifer have been reported" Section 3.4 "Ground Water Resources", page 3-31. Given the significant lack of data, we recommend that NRC provide a more in-depth discussion on the justification of the conclusion that there will be Small to Moderate environmental impacts to groundwater.

17. Contamination has been detected at several private wells that appear to be downgradient from the facility, as described in 3-31. We recommend that the NRC and the CFFF provide a discussion in the Final EIS that addresses what measures are being taken to make sure domestic wells are being protected before concentrations end up increasing in and around the private wells.

18. Section 3.4.1.1.3, "Ammonia", p 3-38, does not discuss potential links between ammonia and nitrate concentration to determine if denitrification is occuring. We recommend that the Final EIS provide a discussion about the potential links between the ammonia and nitrate concentration that would demonstrate denitrification is occuring.

19. The DEIS states that "Only one well, W-18 with a uranium activity of 101 picocurie per liter (pCi/L), was above the WEC-derived criterion of 84 pCi/L in 2007, and it had a relatively high gross alpha activity of 115 pCi/L (WEC 2019-TN6546)" (Page 3-39). We recommend that the Final EIS discuss the WEC-derived criterion in more detail and state what the criterion was based to determine how the limits were determined.

20. Section 3.4.1.2 "Radiological Contaminants" states that the removal of solids from the bottom of the lagoons may have damaged the liner, leading to leaks. Later in the DEIS, it is mentioned that over the course of the 40-year license renewal the lagoons will likely need to have solids removed again and liners will need to be replaced. We recommend that the Final EIS discuss what measures were taken and what measures will be taken to prevent contaminant leakage in the future, as well as the cumulative effect that leakage from a damaged liner will have on the surrounding communities and downstream users.

21. The DEIS states in Section 3.4.1.2.1 “Gross Alpha and Uranium”, p 3-40, that “isotopic uranium activities” but doesn’t explain which isotopes are involved. We recommend that the Final EIS and the Safety Evaluation Report provide a more in-depth discussion as to isotope speciation.

22. The DEIS section 3.4.1.2.2 “Gross Beta and Technicium-99” needs to discuss the historical source of Tc-99 from previous decades, and why gross beta counts at Gator Pond (i.e., Fig 3-11) are basically constant over time after an initial short increasing trend around 2010 and not decreasing afterward. We recommend that the Final EIS provide a more in-depth discussion regarding the history of Tc-99 at Gator Pond.

23. The DEIS states that “…current site operations do not have the potential for significant Tc-99 releases (WEC 2020-TN6538)” (Page 3-42). Given all the uncertainties already described in the groundwater-surface water interactions section, the extent of contamination, and a conceptual site model (CSM) that still contains data gaps. We recommend that the Final EIS and the Safety Evaluation Report provide a more in-depth discussion that determines the source of Tc-99. Based on the characterizations of gross alpha gross beta, nitrate, and fluoride concentrations, there seems to be a plume of contamination under CFFF possibly heading toward the Congaree River. Please explain the steps that WEC is taking to ensure this does not discharge into the river in appreciable quantities.

24. NRC acknowledges that WEC actions have reduced the likelihood of future inadvertent releases but also claims that future inadvertent releases are reasonably foreseeable in Section 3.4.2.1, “Future Releases” page 3-43. We recommend that the Final EIS provide a discussion as to how WEC and NRC determined the reasonably foreseeable releases and discuss what cumulative impact such releases could have on downstream users and the surrounding communities.

25. The DEIS states that “The isolated extent of uranium contamination in groundwater may arise from the size of the releases, which are unquantified, but is more likely due to the relatively low mobility of uranium in the subsurface. Uranium tends to adsorb to natural sediments under near-neutral pH conditions” (Page 3-44). Alternatively, uranium could also be immobilized by being reduced from U(VI), which is the likely form when it is released, to U(IV). We recommend that further input about the geochemistry of the wells be provide in Section 3.12.1 “Sources and Pathways of Radiation and Chemical Exposure”. The neighboring Superfund site is mentioned as a source of contaminated groundwater (VOCs), but it is not clear how this contamination is distinguished from that at CFFF. The Final EIS and Safety Evaluation Report should provide a more in-depth discussion on source pathways along with, the redox conditions of the soils that could support uranium reduction or even denitrification.

26. The search area or search radius used for the USGS earthquake catalog is not listed or defined (Lat/Long boxes or similar), nor does the included location map include a scale bar (Fig 3-4). The USGS peak acceleration map cited in the text could be helpful, especially if it was cropped to the region in question and the CFFF site located. The current map could be combined with the earthquake epicenters plotted. The earthquake magnitude distribution has the potential to be misleading. The output data from the USGS catalog is not typically listed in Richter Magnitude (ML) as is asserted in the text, rather, most seem to be given as Duration Magnitude (MD). At such low magnitudes, the difference between earthquake magnitude scales is minimal, but the

scales used should not be misrepresented. Perhaps simply reporting “magnitude 4” would be the best approach. We recommend that the Seismology Section 3.2.3 “Seismology” provide a more in-depth discussion in the Final EIS.