

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

In the Matter of	)	
	)	Docket Nos. 52-040-COL
Florida Power & Light Co.	)	52-041-COL
Turkey Point Units 6 & 7	)	
	)	ASLBP No. 10-903-02-COL-BD01
Combined Construction and License	)	
Application	)	March 1, 2017
_____	)	

**THE CITY OF MIAMI’S (“CITY”) INITIAL STATEMENTS OF  
POSITION AND DIRECT TESTIMONY FOR CONTENTION 2.1**

NOW BEFORE THE UNITED STATES NUCLEAR REGULATORY COMMISSION’S ATOMIC SAFETY AND LICENSING BOARD, through undersigned counsel, comes the CITY OF MIAMI (“City”), pursuant to 10 C.F.R. Section 2.1207(a)(1), hereby submits the City’s Initial Statements of Position and Direct Testimony for Contention 2.1.

**Background**

On June 30, 2009, FPL filed a Combined License Application under 10 C.F.R. Part 52, for Turkey Point Units 6 and 7 in Miami-Dade County, Florida. The NRC docketed the case on September 4, 2009.

This proceeding concerns a challenge by Mark Oncavage, Dan Kipnis, Southern Alliance for Clean Energy, and National Parks Conservation Association (“Joint Intervenors”) to Florida Power & Light Company’s (“FPL”) Combined Operating License Application (“COLA”) for two new nuclear reactors, Turkey Point Units 6 and 7, to be constructed at FPL’s facility near Homestead, Florida. In February 2011, the ASLB found that Joint Intervenors established

standing to intervene in the COLA proceedings, and proffered one admissible contention, Contention 2.1. *Turkey Point Units 6 & 7*, Memorandum and Order (Ruling on Petitions to Intervene), LBP-11-06 (February 28, 2011). On April 21, 2016, the ASLB issued an Order granting in part and denying in part FPL's Motion for Summary Disposition. *Turkey Point Units 6 & 7*, Memorandum and Order (Granting in Part and Denying in Part FPL's Motion for Summary Disposition), LBP-16-03 (April 21, 2016). In its April 21, 2016 Order, the ASLB identified the sole remaining contention as follows:

The DEIS is deficient in concluding that the environmental impacts from FPL's proposed deep injection wells will be "small." The chemicals ethylbenzene, heptachlor, tetrachloroethylene, and toluene in the wastewater injections at concentrations listed in DEIS Table 3-5 may adversely impact the groundwater should they migrate from the Boulder Zone to the Upper Floridan Aquifer.

*Id.*

The City was granted the ability to participate in the proceedings involving FPL's COLA as an Interested Local Government Body pursuant to 10 C.F.R. Section 2.315 on June 10, 2015. *See Turkey Point Units 6 & 7*, Memorandum and Order (Denying the City of Miami's Petition to Intervene, But Granting Its Request to Participate as an Interested Local Governmental Body), LBP-15-19 (June 10, 2015). The NRC and U.S. Army Corps of Engineers made available the Final Environmental Impact Statement ("FEIS") on October 28, 2016 and published a notice of availability of the FEIS on November 2, 2016 in the Federal Register. The Final Safety Evaluation Report ("FSER") was made available on November 10, 2016.

Pursuant to the ASLB's Amended Scheduling Order issued on February 24, 2017, the deadline for the City, an Interested Local Government Body, to submit its Initial Statement of Position and Direct Testimony for the contested portion of FPL's COLA for Turkey Point Units 6 and 7 is March 1, 2017.

## Statement of Position

### **I. An Adequate Geologic Confining Layer with Sufficient Aerial Extent, Thickness, or Lithological and Hydraulic Conditions Does Not Exist on the Turkey Point Site to Prevent Upward Migration of Injected Wastewater into an Underground Source of Drinking Water (“USDW”)**

FPL has failed to establish that an adequate geologic confining layer with sufficient aerial extent, thickness, or lithological and hydraulic conditions exists on the Turkey Point site to prevent the upward migration of injected wastewater into the Upper Floridan Aquifer, an Underground Source of Drinking Water (“USDW”). The FEIS acknowledges that upward migration of wastewater has occurred at other sites and that “it is possible that an unknown vertical pathway could exist within the area of influence of the injection wells and could lead to eventual upward migration of wastewater into the USDW.” FEIS at 5-40.

The FEIS further identifies the Upper Floridan Aquifer as “an important source of freshwater in parts of Florida . . . .” FEIS at 2-54. The FEIS further notes that “water from the Upper Floridan is too saline . . . in southeastern Florida to be used for drinking water without treatment” and that “the Upper Floridan aquifer . . . is not used as a source of groundwater in the area in which migration of the injected cooling water may reasonably be expected.” FEIS at 2-54 and 5-41. Although water from the Upper Florida Aquifer must be treated to be used as drinking water, the FEIS completely ignores the fact that water from the Upper Floridan Aquifer is being used by some municipalities in Miami-Dade County as a source of drinking water.<sup>1</sup> As such,

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<sup>1</sup> “The new plant draws water not from the Biscayne Aquifer, which supplies most local facilities, but from the Floridan Aquifer, which is deeper underground.” Patricia Mazzei, *Hialeah water plant’s long delay upsets Miami-Dade commissioner*, MIAMI HERALD, June 26, 2014 at <http://www.miamiherald.com/news/local/community/miami-dade/hialeah/article1972939.html>.

See also Declaration of David McNabb in Support of Florida Power & Light Company’s Motion for Summary Disposition of Joint Intervenors’ Amended Contention 2.1 at ¶ 24, ML 15349A991 (Dec. 15, 2015).

there is great concern with the potential upward migration of radioactive wastewater into the USDW since the Upper Floridan Aquifer is being used as a source of drinking water.

Like the Environmental Report (ER) submitted by FPL and as has been noted in the various arguments submitted by the Joint Intervenors, the FEIS presumes that the Boulder Zone of the Lower Floridan Aquifer in southern Florida is isolated from the overlying Upper Floridan Aquifer by thick confining units. However, additional research needs to be conducted because USGS has noted that the limestone and dolomite that overlays the Boulder Zone simply “retards” the upward migration of injected wastewater into the USDW.<sup>2</sup>

Therefore, FPL has failed to establish that an adequate geologic confining layer with sufficient aerial extent, thickness, or lithological and hydraulic conditions exists on the Turkey Point site to prevent the upward migration of injected wastewater into the Upper Floridan Aquifer, an Underground Source of Drinking Water (“USDW”).

## **II. Fluid Induced Seismicity Can Cause Cracks and Faults in the Geologic Confining Layer Allowing for the Upward Migration of Injected Wastewater into the USDW**

One topic which has not been addressed is the possibility of fluid induced earthquakes causing cracks and faults in the geologic confining layer. As is noted in the Affidavit of Dr. Jean-Pierre Bardet (“Bardet Affidavit”), wastewater disposal wells have the possibility of inducing seismicity or earthquakes. Bardet Affidavit ¶ 9. Assuming that an adequate geologic confining layer exists, which it does not, the potential of fluid induced seismicity or earthquakes has the potential of causing cracks and faults in the confining layers allowing for the upward migration of radioactive wastewater. Moreover, since there is not an adequate geologic confining layer,

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<sup>2</sup> See Ground Water Atlas of the United States, Alabama, Florida, Georgia, South Carolina, HA 730-G, available at [https://pubs.usgs.gov/ha/ha730/ch\\_g/G-text6.html](https://pubs.usgs.gov/ha/ha730/ch_g/G-text6.html).

fluid induced seismicity or earthquakes has the potential of accelerating the upward migration of radioactive wastewater because the resulting cracks and faults created would provide additional paths for the wastewater to migrate upwards. It is imperative to determine the potential and probability of fluid induced seismicity because the risks associated with the creation of cracks and faults in the confining layer are high.

There are several factors that need to be considered to determine the possibility and probability of a fluid induced earthquake including the injection rate and total volume injected; the presence of faults that are large enough to produce felt earthquakes; stresses that are large enough to produce earthquakes; and the presence of pathways for the fluid pressure to travel from the injection point to faults. *Id.* at ¶ 11. This analysis and information is lacking in the FEIS.

The FEIS states that seismic-reflection studies performed in southeastern Florida by the United States Geological Survey (“USGS”) “have identified both linear tectonic faults and ‘karst collapse’ structures up to about two (2) mi in diameter that may result in areas of increased vertical flow through the Floridan aquifer confining units such as the MCU.” FEIS at 2-55. This is confirmed by the testimony of Mark Quarles, the expert for Joint intervenors, who noted that tectonic faults and karst collapses breach bedrock confining layers in the Floridan Aquifer system. Third Affidavit of Mark A. Quarles at ¶ 31, ML 16034A491 (Feb. 3, 2016). The expert for the Joint Intervenors further notes that one of the breaches is a fault that runs along the shoreline of Biscayne Bay, where Turkey Point is located. *Id.*

Despite the acknowledged presence of these faults and karst collapses and evidence of their existence, no seismic data has been collected at the Turkey Point site. FEIS at 2-55. Further,

FPL has made a determination that a continuous horizontal stratigraphy is present with no faults or folds related to tectonic deformations within a twenty-five (25) mile radius of the site. *See* FEIS at 2-209. The presence of these faults and karst collapses should have initiated or required additional research to determine not only the potential upward migration of radioactive wastewater into the USDW, but the potential for fluid induced seismicity.

Moreover, assuming that FPL's studies and review of the area and bedrock does not find any faults, it is still prudent that an analysis be conducted to determine the potential for fluid induced earthquakes because the presence of faults is only a factor in determining the probability of felt earthquakes. Fluid induced earthquakes, whether felt or not, have the potential of producing cracks in the confining units and/or the destabilization of sediment around the wells. Bardet Affidavit ¶ 12. Given that USGS has found that wastewater injection well disposal is the primary cause of the recent increase in earthquakes in the central U.S., it is imperative that FPL analyze the potential of earthquakes due to its intent to use up to thirteen (13) wastewater disposal wells. *Id.* at ¶ 10.

As such, FPL has failed to demonstrate that the environmental impacts of from its proposed deep injection wells will not be "small" because of the possibility of fluid induced earthquakes causing cracks and faults in the geologic confining layer that will allow for the upward migration of radioactive wastewater.

### **III. Initial Statements of Position and Direct Testimony of Joint Intervenors**

The City of Miami adopts by reference the filings of the Joint Intervenors in these proceedings.

### **Conclusion**

For the aforementioned reason, the City of Miami submits that the environmental impacts from FPL's proposed deep injection wells will not be "small." Further, the chemicals ethylbenzene, heptachlor, tetrachloroethylene, and toluene in the wastewater injections at concentrations listed in DEIS Table 3-5 may adversely impact the groundwater because they will migrate from the Boulder Zone to the Upper Floridan Aquifer. The City of Miami respectfully requests that the United States Nuclear Regulatory Commission's Atomic Licensing and Safety Board find that an adequate geologic confining layer with sufficient aerial extent, thickness, or lithological and hydraulic conditions does not exist on the Turkey Point site to prevent the upward migration of injected wastewater into the Floridan Aquifer. The City of Miami respectfully requests that the United States Nuclear Regulatory Commission's Atomic Licensing and Safety Board require, in addition to requiring FPL to conduct additional research and studies to definitively demonstrate that there is an adequate geologic confining layer, to definitely demonstrate that fluid induced seismicity would not cause cracks or faults that would allow the upward migration of the injected wastewater.

Respectfully Submitted,

Signed electronically by: /s/ Xavier E. Albán

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**Certificate of Service**

I hereby certify that on March 1, 2017, I electronically filed the foregoing statement with the electronic filing system of the U.S. Nuclear Regulatory Commission and that persons and parties of record were electronically served.