

Collin Roehner

From: Office of Commissioner Brown
Sent: Monday, December 12, 2016 11:08 AM
To: Commissioner Correspondence
Subject: FW: Concerns
Attachments: case_petition_to_intervene_final_report_eis_tp_6_and_7__revi.pdf; FPL Wants to Store Radioactive Waste Under Miami's Drinking Water Supply _ Miami New Times.pdf

Please place in Docket Correspondence, Consumers and their Representatives, in Docket Nos. 160007-EI and 160009-EI.

Thank you.

From: Beatrice Balboa [mailto:beatricebalboa@gmail.com]
Sent: Friday, December 09, 2016 8:08 PM
To: Consumer Contact
Cc: eduardo.balbis@psc.state.fl.us; Office Of Commissioner Graham; Office of Commissioner Brown; Office Of Commissioner Edgar; Ronald Brisé
Subject: Concerns

I was reading the latest news media article(s) regarding the latest Florida Power & Light Co. (FPL) environmental activities in Southeastern Florida with great interest. Please review and implement an action plan to thoroughly address this extremely troubling issue. Media reports continue to underscore the ongoing significant environmental law violations by FPL, despite strong evidence of adverse impact of these activities. It is imperative that these FPL activities be brought into compliance with Federal, State and County environmental laws and statutes. And yet, FPL may be requesting ratepayers to "foot the bill" for their wanton disregard for the rule of environmental law. Please coordinate, collaborate and cooperate on Federal, State and/or local jurisdictional levels in addressing these concerns potentially impacting adversely the public's health, finances, policies, trust, confidence, and quality of life issues. Thank you for your time in this matter and hope to hear from you soon.

Sincerely,

Beatrice Balboa

1010 South Ocean Boulevard, Apt. 1008

Pompano Beach, Fl 33062-6631

xxx

<http://www.miaminewtimes.com/content/printView/8971822>

xxx

FPL Wants to Store Radioactive Waste Under Our Drinking Water Supply
WEDNESDAY, DECEMBER 7, 2016 BY JERRY IANNELLI

Florida is basically one gigantic hunk of porous limestone with pythons, buildings, and Medicare frauds sunning themselves on top. Underneath is South Florida's main source of drinking water, the Biscayne Aquifer, a pristine pool of underground liquid that's become increasingly susceptible to pollution and saltwater intrusion.

Just below that sits another, deeper store of H2O called the Floridan Aquifer. Thanks to that porous limestone, water sometimes mixes between the two.

And that's why it's more than a bit alarming that Florida Power & Light (FPL) is pushing ahead with plans to inject radioactive waste into the Floridan Aquifer's lowest zone over the next few decades, after building two

new nuclear reactors in South Florida. Environmentalists contend the plan could leak carcinogens such as cesium, strontium 90, and tritium right into South Florida's largest drinking water source.

Last week, a nonprofit environmentalist group that has frequently sparred with FPL, the Citizens Allied for Safe Energy (CASE), filed a formal petition to hold a hearing to stop the utility company's plan. The group filed November 28 — FPL now has 25 days to respond to the complaint.

"Everything will be put into a supposedly 'hermetically sealed' boulder zone," CASE's president, Barry J. White, says, "but anybody who lives in South Florida knows nothing below us is hermetically sealed."

An FPL spokesperson, Peter Robbins, provided the following statement to New Times:

After an exhaustive and comprehensive review of the proposed Turkey Point Units 6 & 7 project, including the plans to safely use reclaimed water for cooling, the independent Nuclear Regulatory Commission's staff concluded "...there are no environmental impacts to preclude issuing Combined Licenses to build and operate two reactors next to the existing Turkey Point nuclear power plant."

We will be reviewing the allegations made by CASE in this document, which was filed after the Environmental Impact Statement was issued, and will respond at the appropriate time. It's important to note that the system will be closely monitored and is designed to ensure that upward flow from the Floridan Aquifer is not taking place.

But the radioactive-waste issue is just the latest flap for the utility monopoly. FPL recently won a yearlong fight to raise customer rates by \$811 million despite turning a \$1.6 billion profit last year. The company also wasted \$8 million on a failed plan to deceive voters and make it harder for them to obtain solar panels for their homes.

FPL's parent company also partly owns the Sabal Trail pipeline, which, if built, will controversially run from central Alabama, through Georgia, and down to Orlando. Protest camps have sprung up in three Florida cities to stop the pipeline's progress.

The new radioactive-waste fight stems from FPL's long-standing plan to expand the much-ballyhooed nuclear plant at Turkey Point. The power company — a "legalized monopoly" within Florida that's long been accused of buying off the state Legislature with campaign cash — wants to build two new reactors, numbers 6 and 7, at the plant over the next decade or two.

Earlier this year, Miami-Dade County officials said Turkey Point is almost certainly leaking radioactive waste into Biscayne Bay, though at levels that most scientists agree is safe for humans. After that news broke, FPL decided to postpone building the new reactors for four more years. That means the new towers won't be operational until roughly 2030.

But the extended timeframe doesn't mean Miamians can stop paying attention to the project. FPL is applying for licenses to build the new towers, as well as crafting a host of plans to get the new wing operational. This includes a review from the U.S. Nuclear Regulatory Commission (NRC), which issued an environmental impact statement in May.

As part of that plan, FPL says it plans to stash chemicals used to clean the reactors, as well as "radwaste" — waste that contains radioactive material — inside the so-called boulder zone. The zone, which sits about 3,000 feet below ground, is mostly rocky but does contain saltwater. Miami-Dade County has used the zone before to stash both treated and untreated sewage — but activists say that's no excuse for placing radioactive waste there.

"Two wrongs don't make a right," White says. "I've always opposed dumping anything there."

The feds must approve FPL's plan under a law called the National Environmental Policy Act, which stipulates that governmental agencies must take a "hard look" at any possible risks a plan like FPL's would pose. (The "hard look" provision is legally vague and sparks frequent fights among environmentalists, energy companies, and the government.) FPL initially applied to build the new reactors in 2009, but the government issued its final Environmental Impact Statement only this past October. The NRC allowed the project to move forward.

But CASE says the government ignored a number of small but frightening details when it comes to storing radioactive waste underground: For one, government documents themselves say the Floridan's boulder zone could possibly leak into the ocean.

According to CASE's complaint, the United States Ground Water Atlas, a government document, warns that the boulder zone "is thought to be connected to the Atlantic Ocean, possibly about 25 miles east of Miami, where the sea floor is almost 2,800 feet deep along the Straits of Florida." CASE's petition says the NRC failed to address this issue.

"Liquid Radwaste? Into the Boulder Zone?" the petition says. "Our members probably have not even heard of that and, when they do, it will scare the daylight out of them. Even small, diluted amounts of radioactive waste will accumulate and concentrate radiation which is not confined like water and can be absorbed by plant life."

More frightening, in January 2016, in a hearing related to Turkey Point Reactors 3 and 4, FPL's own engineer testified that the boulder zone could leak upward into the Biscayne aquifer — AKA, Miami-Dade's drinking water.

MR. ANDERSEN: Yes. I agree with everything Bill is saying. In addition, too, that there is an upward hydraulic gradient from the Floridan [Aquifer] to the Biscayne [Aquifer]. The Floridan is under pressure. Therefore, you have flow from the Floridan into the Biscayne and not vice versa.

Likewise, CASE cited a 2000 University of Miami study that also warned that material injected into the boulder zone can float to the surface.

"Effluent injected from Turkey Point will flow up the surface's gradient to the northwest and then probably north, where it will have many opportunities to encounter breaks in the permeability barrier in this lateral travel," the petition says.

CASE says the NRC failed to investigate either of these issues as well.

"Thus, as these two studies show, there is no guarantee that the discharges of harsh chemicals into the boulder zone will stay put," CASE warns. "It is more likely that they will migrate in all directions and, over time, pose a threat to the entire Biscayne Aquifer, which covers some 4,000 square miles in South Florida."

White, who wrote the petition, faults FPL for clinging to a 20th-century business model too reliant on fossil fuels and nuclear energy.

"They have ignored the potential of a different business model," White says. In his petition, he claims that the state could add \$200 million in GDP from renewable energy sources — and that FPL could rake in a huge cut of that money if it commits to building clean energy sources.

CASE also raised three other major issues with the new reactors, including that the two towers might suck far too much freshwater from the state's aquifers.

"Our organization's whole objective is to return Turkey Point to being a wetland," White says. "We don't need it to be totally clear. They can put solar array down there. I wouldn't even mind if they used gas. But they need to do it without impinging on the needs of the land."

If the NRC doesn't listen, he says, his next step will be to try to get the attention of the Florida Legislature.

"People have injected this waste into the land before, but not into a flowing body of water like this," he says. "How anybody who has an iota of conscience can put radioactive waste into a body of water that humans and animals use, it's like, 'Are you crazy? What are you doing?'"

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
BEFORE THE SECRETARY

In the Matter of)
)
FLORIDA POWER AND LIGHT)
)
) Docket Nos. 52-040 COL
) and 52-041 COL
(Turkey Point Nuclear Power Station,)
Units 6 & 7))
)
November 28, 2016

CITIZENS ALLIED FOR SAFE ENERGY PETITION TO
INTERVENE AND REQUEST FOR A HEARING IN OPPOSITION
TO THE FINAL REPORT EIS GRANTING COL'S FOR TURKEY
POINT UNITS 6 & 7

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INTRODUCTION

This is a Petition To Intervene and request for a hearing filed under 10 C.F.R. § 2.309 in opposition to Environmental Impact Statement for Combined Licenses (COLs) for Turkey Point Nuclear Plant Units 6 and 7 – Final Report (NUREG-2176). It is being filed in a timely manner as described in this Board’s ORDER (Granting Extension to File Petition to Intervene and Request for a Hearing)” of November 23, 2016. Citizens Allied for Safe Energy (CASE), a Florida not-for profit corporation, is filing this petition on behalf of its members who reside within 50 miles of Turkey Point at Homestead, Florida.

CASE is filing pro se. CASE's authorized representative is Barry J. White, 10001 SW 129 Terrace, Miami, FL 33176 305-251-1960 bwtamia@bellsouth.net.

STANDING

Under 10 C.F.R. § 2.309 since CASE has established standing in these proceedings it is not required to do so again:

(C) 4) Party or participant. A new or amended contention filed by a party or participant to the proceeding must also meet the applicable contention admissibility requirements in paragraph (f) of this section. If the party or participant has already satisfied the requirements for standing under paragraph (d) of this section in the same proceeding in which the new or amended contentions are filed, it does not need to do so again.

CASE filed a petition to intervene and requested a hearing in these proceedings in August 2010. Petition for Intervention (Aug. 17, 2010) (ADAMS Accession No. ML102300287) The Board granted the Petition upon finding that CASE had shown standing and had proffered at least one admissible contention.

REASON FOR THE PETITION

The essential concerns and issues for which CASE and its members were granted standing in 2011 still exist for its members. In this particular matter, the almost colossal scope of the project and its intrusive impact and scaring of the pristine and rare Turkey Point wetland and the potential damage and threat to the surface and subterranean nature and functioning of the ecosystem, the ecology, the water supply and the very foundation and sustainability of life in the area are of great concern. to CASE members. The susceptibility of Turkey Point to sea level rise and storm surge is especially disconcerting and do not seem to have been sufficiently

taken into consideration in the recommendation to approve the COL. As evidenced by the member declarations attached, the threat is current and existential. CASE members deserve to have their contentions admitted and discussed at a hearing. The threats to them and to their descendants for years to come are real, heartfelt and upsetting. They are alarmed at the possibility of introducing liquid radiological waste into the Boulder Zone. NEPA promises protection from these intrusions but does not seem to have been honored. CASE members believe the approval of the COL was ill advised and not thoroughly or objectively considered. This review will highlight the NRC Staff's failure to take into into the frequent admonitions of the review team regarding the uncertainty, and therefore the unpredictably of the impact of, many of the measures they were approving in granting the applicant's COL.

CONTENTIONS

- 1) THE USE OF RECLAIMED WASTE WATER FOR THE COOLING TOWERS WAS NOT FULLY EVALUATED AND IS UNLIKELY DUE TO THE HIGH COST OF REMOVING NITROGEN AND PHOSPHORUS AND THE EVENTUAL UNAVAILABILITY OF RECLAIMED WASTE WATER
- 2) THE PROBABLE HEAVY USE OF WATER FROM THE UPPER FLORIDAN AQUIFER USING RADIAL COLLECTOR WELLS HAS NOT BEEN FULLY EVALUATED AND COULD RESULT IN CATASTROPHIC DRAINAGE OF FRESHWATER FROM THE AQUIFER REQUIRED TO ABATE SALTWATER INTRUSION AND FOR HUMAN USE.
- 3) THE IMPACT OF INJECTING TOXIC CHEMICALS AND LIQUID RADWASTE LADEN WATER FROM THE REACTORS DIRECTLY INTO THE BOULDER ZONE WAS NOT FULLY EVALUATED IN THE EIS
- 4) NEPA WAS NOT FULLY HONORED IN SPIRIT OR LETTER BY THE NRC STAFF WHICH APPROVED MEASURES POTENTIALLY HARMFUL TO THE ENVIRONMENT

OVERVIEW

It's all about freshwater; there is just not enough in South Florida for all of the demands on it. This project, ultimately, threatens its quality and availability; the EIS did not adequately consider this reality. And the Biscayne Aquifer is not a bottomless, confined dumping ground; out of sight, out of mind. With Turkey Point 3 & 4 the concern was about the impact on surface water quality and saltwater intrusion from over using freshwater. With Turkey Point 6 & 7 there is lots of water available, reclaimed water and seawater, but the questions are: where will it all go and what will it do to the ecology of the area and to the aquifer after it has been used? The crux of CASE's members' concerns with the prospect of Turkey Point Units 6 & 7 being constructed are reflected the following disturbing observations and admonitions from the EIS, at 5-7,

5.2 Water-Related Impacts

*Managing water resources requires understanding and balancing the tradeoffs between various, often conflicting, designated uses. At the site of the proposed Turkey Point Units 6 and 7, FDEP designates Biscayne National Park as an Outstanding Florida Water, meaning **there is to be no degradation of its water quality** (FDEP 62-302.400(14) and FDEP 62-302.700(9)(a)1) (Fla. Admin. Code 62-302-TN776). The canals in the area (constructed before November 28, 1975) are evaluated based on the **limited aquatic life support and habitat limits of these waters** (FDEP 62-302.400(4) [TN776]).*

5.2.1 Hydrological Alterations

The staff assessed the following potential hydrological alterations associated with the operation of Units 6 and 7 and the resulting effects on the environment

- *Operation of RCWs under Biscayne Bay for use as a backup supply of cooling water that would remove water from Biscayne Bay, the industrial wastewater facility (IWF), and the Biscayne aquifer.*
- *Injection of station blowdown water and other liquid waste streams into the Boulder Zone—a cavernous, **high-permeability** South*

Florida geologic horizon located at depths of approximately 2,900 to 3,500 ft in the Lower Floridan aquifer.

- *Deposition of drift from Units 6 and 7 cooling towers, including associated **salt and chemical contaminants**, onto nearby aquatic and terrestrial systems. With the use of reclaimed water as the cooling-tower water supply, **chemical contaminants** could be present **in the cooling tower water and drift**. With the use of the Biscayne Bay as a backup supply of water (via the RCWs), **salt deposition could occur on terrestrial and aquatic systems**.*
- *Stormwater runoff from buildings, pavement, and RWTFs, and accompanying **changes in the quality** of runoff water from the spoils disposal area.*

The enumeration of these many admonitions and reservations by the review team in the EIS about the potential negative impacts and uncertainties of the science and prognosis of the impact of major aspects of the operation of the proposed power plant does call into question the efficacy and the rationale of the entire project. If we are out to produce energy, we must ask “at what cost and at what risk?.” The EIS speaks of many uncertainties and reservations in its analysis which NRC Staff seems to have ignored or found not to be significant. For example, the review team states:

*Numerical models are numerical representations of complex processes occurring in three dimensions over time. The appropriate role of a numerical model is to test assumptions of the behavior of complex systems. **While running a numerical model numerous times with different parameters cannot compensate for all uncertainties, the models employed here have been tested and benchmarked within the conditions that limit their application. In this assessment the review team used models to test possible consequences of changes in the affected environment***

*and uncertainty in some subsurface parameters within the capability of the models employed. This information was combined with the geography of the RCW field (such as the relatively short distance from the laterals to the bottom of Biscayne Bay relative to the distance from the laterals to the Homestead well fields) and the COC requirement of a monitoring program with mitigation options. The review team determined that the proposed monitoring of RCW construction and operation that is included is sufficient to detect unexpected behavior in a timely manner. While all possible mitigation measures have not yet been spelled out, in accordance with the COCs, the review team considers the ultimate mitigation of ceasing operation of the RCWs as ensuring prevention of any impacts in a timely manner. "When harm occurs, or is imminent, SFWMD will require Licensee to modify withdrawal rates or mitigate the harm" (FDEP COCs Page 61) **All groundwater models are subject to uncertainty** caused by model assumptions and limited characterization data. Therefore, results from both the USGS model and the FPL groundwater model were only used qualitatively by the review team to understand potential impacts. The model results combined **with the available characterization data supporting the leaky character of the Biscayne aquifer**, and give confidence that the fraction of fresh groundwater that would be captured by the RCWs is small compared to the fraction that would come from saltwater in the bay. The review team estimated that the worst-case volume of groundwater removed from the Biscayne Aquifer could reasonably be as high as 4,500 gpm during RCW operation. This represents 5 percent of the water produced by the RCWs and is conservatively 166 times greater than the fraction estimated by the base-case FPL groundwater model.*

One would wonder, given these strong and frequent statements of uncertainty by the review team, why no field testing appears to have been for a project of this magnitude before approving a project of these vast proportions. Considering that the reactors would operate over many

decades, the cumulative impact of even a small challenge to the ecology would be very great. An exhaustive EIS would have take this into account.

DISCUSSION OF CONTENTIONS

CONTENTION ONE

- 1) THE USE OF RECLAIMED WASTE WATER FOR THE COOLING TOWERS WAS NOT FULLY EVALUATED AND IS UNLIKELY DUE TO THE HIGH COST OF REMOVING NITROGEN AND PHOSPHORUS AND THE EVENTUAL UNAVAILABILITY OF RECLAIMED WASTE WATER

Although the use of reclaimed waste water (RCW) from the Miami-Dade County Water and Sewer Department (MDCWS) is probably an ideal source of water for the proposed reactors, there are some mitigating factors which might obviate its use.

COST OF REMOVING NITROGEN AND PHOSPHORUS

The estimated cost of building a plant to treat the reclaimed waste water from the MDCWS is, currently, \$400 million dollars. And, it is reported, such a plant is not inexpensive to operate. Most likely, by the time such a water treatment plant is built, the technology and the cost would make the plant economically feasible to build and to operate but currently, it is quite expensive. And, if these costs do not modulate, they could be high enough for the applicant to revert to the back up use of seawater from the Radial Collector Wells.

POSSIBLE RELOCATION OF MDCWS FACILITY

The planned piping of reclaimed water from the nearby water treatment plant could be terminated by the possible abandoning or relocation of the plant due to sea level rise and/or the increase in salinity of water in the Biscayne Aquifer at that point. Sea level rise is already significant at times through the year and is predicted to be substantial in the area by 2050,

within the initial proposed life of the new reactors. Also, salt water intrusion has already cause MDCWS to abandon some wells in the area from which it and the local farmers and home owners were drawing water from the Biscayne Aquifer. The availability of freshwater in the area is already a major challenge to residents and to the municipal water departments.

In this regard, Dr. Douglas Yoder, Deputy Director of the Miami Dade County Water and Sewer Department ,told CASE today in an email

The work we've done with respect to sea level rise impacts to our water plants has focused on saltwater intrusion more than rising ground water that will result from sea level rise (and that will be impacted by whatever changes in the regional drainage system may prove to be viable). Our modeling thus far indicates that into the 2040 timeframe our wellfielde should be able to provide water meeting chloride standards. We are continuing that work with the US Geological Service on that issue. Regional modeling with respect to the drainage system under different sea level rise scenarios is the key to future planning, in my mind. We can modify treatment technology to deal with saltier water, but it is not so easy to deal with chronic flooding on a regional basis. The wellfielde most at risk currently from salt intrusion is the Newton wellfielde, which was originally constructed for the sole purpose of providing fresh water to the FPL complex at Turkey Point. The risk there is not from sea level rise (for now), but from the salt plume emanating from the cooling canals. Conditions there are being monitored carefully as analysis of the plan to stabilize conditions related to the cooling canals continues, primarily under RER/DERM (Regulatory and Economic Resources - Miami-Dade County/Department of Environmental Regulation). FPL has indicated that they may establish their own water supply at Turkey Point in the future, presumably from the Floridan aquifer.

Further to Dr. Yoder's comments, Dr. Harold R. Wanless, Professor and Chair of the Department of Geological Sciences at the University of Miami, told CASE in an email today:

1. *Within thirty years, Turkey Point and its nuclear plant will be sitting in the middle of the combined Biscayne Bay – Florida Bay shallow marine environment because of at least two feet of further sea level rise. Its location will be a major national security risk as it will be approachable (attackable) from 360 degrees and the air.*

2. *Within thirty years, Turkey Point will be surrounded by a shallow marine environment because of at least 2 feet of further sea level rise. The current cooling canals will be inundated by salt water. The proposed pipeline of inadequately treated recycled waste water will be vulnerable to severe storm surge erosion and breakage, AND the injection of the used recycled wastewater (fresh) into the boulder zone will be moving northwest and inland under the Everglades and the developed portions of Miami-Dade where it will leak upwards through cracks and holes in the thin impermeable zone and through the Floridan Aquifer (saline) polluting what will become our source of drinking water (the brackish portions of the Floridan).*

3. *Also the risk of siting a nuclear plant in the middle of the ocean and the costs of cleaning and removing it later this century have not been considered. The current high projection for sea level rise by the US Government are 6.6 feet by 2100. This is most certainly low because of accelerating feedbacks of ice melt that are being documented in both Greenland and Antarctica. Nevertheless, as a major infrastructure project, it is critical to the health, welfare and safety of the people of south Florida that at least this sea level rise projection be used and be incorporated into all aspects of the consideration for the need and safety of siting a nuclear facility at Turkey Point.*

A report by NOAA, December 6, 2012, *Global Sea Level Rise Scenarios For The United States National Climate Assessment* (attached) gives an over view of the concerns of Dr. Yoder and Dr. Wanless:

Conclusion

Based on a large body of science, we identify four scenarios of global mean Sea Level Rise (SLR) ranging from 0.2 meters (8 inches) to 2.0 meters (6.6 feet) by 2100. These scenarios provide a set of plausible trajectories of global mean SLR for use in assessing vulnerability, impacts, and adaptation strategies. None of these scenarios should be used in isolation, and experts and coastal managers should factor in locally and regionally specific information on climatic, physical, ecological, and biological processes and on the culture and economy of coastal communities. Scientific observations at the local and regional scale are essential to action, and long-term coastal management actions (e.g. coastal habitat restoration) are sensitive to near-term rates and amounts of SLR. However, global phenomena, such as SLR, also affect decisions at the local scale, especially over longer time horizons. Thousands of structures along the US coast are over fifty years old, including vital storm and waste water systems. Thus, coastal vulnerability, impact, and adaptation assessments require an understanding of the longterm, global, and regional drivers of environmental change.

The scope of the concerns of these scientists is monumental as is the literal sea change at hand. South Florida is ground zero for all of the impacts of climate change. Did the EIS sufficiently consider this? And what are the consequences for CASE's members if they did not.

The Keys Aqueduct Authority which draws water from about six miles west of Turkey Point has already constructed a water desalinization plant in the Keys, at great expense, due to the diminished quality of the water in the Biscayne Aquifer.

INTERNAL CONFLICT

In the EIS, at 5-58, we read,

5.3.2.1

Use of Radial Collector Wells

*FPL proposed to install four RCWs beneath Biscayne Bay to provide a secondary source of cooling water. This system would not use a surface-water intake structure and would be used when reclaimed water from MDWASD is not available (see EIS Section 3.2.2.2). FPL has proposed, and FDEP has permitted, that **RCW use would be limited to a maximum of 60 days per year** (FPL 2012-TN2688; State of Florida 2014-TN3637).*

If, as CASE has described above, reclaimed water is not available because the cost to process it is deemed to be too expensive or it is not available because the MDCWS must move its water treatment plant, and the of the RCW's is limited to 60 days, **where would the water to cool the towers come from?** One would assume that the applicant would ask to use the RCW's all of the time multiplying the negative impact of the extraction of water from the aquifer by six times. But, the additional operating time is not guaranteed; it was limited to that number of days for a reason. Without this concession it might not be possible to build the reactors at all.

CONTENTION TWO

- 2) THE PROBABLE HEAVY USE OF WATER FROM THE UPPER FLORIDAN AQUIFER USING RADIAL COLLECTOR WELLS HAS NOT BEEN FULLY EVALUATED AND COULD RESULT IN CATASTROPHIC DRAINAGE OF ACTUAL AND NEAR FRESHWATER FROM THE UPPER FLORIDAN AQUIFER REQUIRED TO ABATE SALTWATER INTRUSION AND FOR HUMAN USE.

The review team, at many points in the EIS, describes the uncertain impact of drawing 60 to 90 MGD of water per day from the Biscayne Aquifer for the cooling towers. The multi-layered aquifer system in South Florida is interconnected in many ways so extracting the vast amount of sea water (UP to 125 MGD) required for the cooling towers will draw water from every direction and will increase and force the flow of water between the various levels and strata of the aquifer.

Given the scarcity of freshwater in the area, any action which diverts or uses it will be catastrophic given the already challenged aquifer. Freshwater is required to abate the inland flow of salt water as well as for human, agricultural and business use. All of South Florida is on permanent water rationing and the historic availability of water from central Florida has been reduced and is the target of major programs to restore it. There is just not enough freshwater in South Florida so any diversion of it is problematical.

In this regard, as explained at 5.2.1.1 in the EIS, page 5-8 to 5-10, Effect of Radial Collector Well, the section, which **only speaks to salinity**, concludes that, even running full time, salinity would not be a problem. Appendix G discusses, for the most part, how much water the RCW's would draw from the IWF, the cooling canals, which they conclude would be less than 4% of the water withdrawn from Biscayne Bay. However, the USGS study does provide more caveats and uncertainties:

Assessment – Radial Collector Wells

*The FPL model provides a reasonable, although **uncertain**, prediction of the impact of the RCWs on the Biscayne Bay and freshwater resources within the Biscayne aquifer. Parameter **uncertainty** in the FPL model prediction for the RCW water source is caused by several factors including the following:*

- limited area of the pumping test observations used for calibration*

compared to the extent of the model

- *large number of model parameters compared to the limited amount of*

calibration data

- *limited data on the site-specific hydraulic properties of hydrogeologic units except at the pump test locations used in calibration*
- *lack of data on the hydraulic conductivity of the sediment at the bottom of Biscayne Bay.*

***Incomplete knowledge** of the hydrogeologic system being modeled, the impacts of assuming constant density fluid, the assumption of a steady-state flow system, and problems related to discretization of the model into a cellular grid also cause conceptual model and structural **uncertainty** in the FPL model results. One of the most significant **uncertainties** in the model is the hydraulic conductivity assigned to the sediment at the bottom of Biscayne Bay..*

Despite these cautionary statements, the USGS report tells us:

Conclusions

The environmental impact of operating the proposed RCW system is the most important issue addressed by the groundwater model.

*The FPL model results indicate that continuous operation of the RCW results in **extraction of a relatively small volume of water from the inland portion of the Biscayne aquifer** and that the velocity of water moving downward from Biscayne Bay into the seabed is very low at less than 0.001 cm/s. The NRC staff's largest concern with the model is caused by **uncertainty** in the model parameters, especially in light of the limited area of calibration data and **the large number of parameters that must be estimated**. *This may have a significant impact on the predicted volumes of water that would be extracted from the inland portion of Biscayne aquifer along the northwest corner of the model area and the amount captured from the industrial**

wastewater system. Thee NRC staff regards model estimates of inflow to the proposed excavations as more accurate than estimates of RCW captured water sources because of the knowledge of hydraulic parameters in that immediate area of the planned excavations

So, in reading this excerpt, and, more to the point, reading the EIS statements fully, it appears that the NRC Staff ignored the reservations of the review team regarding the reliability of the the data in this analysis.

The review team, at many points in the EIS, describes the uncertain impact of drawing 60 to 90 MGD of water per day from the Biscayne Aquifer for the cooling towers. The review team specifically says above that there could be significant difference in the water drawn from inland sources, one of major concerns of CASE's members and anyone else involved in assuring that sufficient freshwater is available for its many uses. The multi-layered aquifer system in South Florida is interconnected in many ways so extracting the vast amount of water required for the cooling tower will draw water from every direction and will increasing the flow of water between the various levels and strata. Given the scarcity of freshwater in the area, any action which diverts or uses it or near fresh slightly brackish water will be catastrophic given the already challenged aquifer. Freshwater is required to abate the inland flow of salt water as well as for human, agricultural and business use. All of South Florida is on permanent water rationing and the historic availability of water flowing through the Everglades from central Florida has been reduced and is the target of major programs to restore it. There is just not enough freshwater in South Florida so any diversion of it is problematical. The conclusion drawn by the NRC staff regarding the amount of water which the operation of the RCE's will draw for all directions does not follow from the discussion by the review team nor is it supported by the uncertain data. This could be a catastrophic miscalculation with grave consequences for the area.

CONTENTION THREE

3) THE IMPACT OF INJECTING TOXIC CHEMICALS AND LIQUID RADWASTE LADEN WATER FROM THE REACTORS DIRECTLY INTO THE BOULDER ZONE WAS NOT FULLY EVALUATED IN THE EIS

On June 2, 2016 FPL sent a document (Liquid Waste Management ML16155A160) to the NRC.. The document is described as a *slide summary for FSAR Sec. 11.2*. It says it was sent and created by Steve Franzone, NNP Licensing Manager - COLA with the quotation: “*Care about people's approval and you will be their prisoner.*” ~ Lao Tzu While most of the information is seen in the EIS, a few comments in the document are of interest.

*Slide 1 • Non-traditional disposal method for **liquid radioactive waste***

Discharge via deep well injection system (DIS) to the Lower Floridan aquifer (Boulder Zone), approximately 3000 feet below ground surface (bgs)

Not anticipated that radioactive waste effluent injected into the Boulder Zone would reach either an underground source of drinking water or the surface environment due to:

» *Confinement*

» ***Decay (slow movement and distance)** (emphasis added)*

Slide 2 Processed liquid radioactive waste will be discharged to the plant blowdown sump pump discharge line prior to release

- *The **required minimum dilution** factor to control the concentrations of liquid radioactive waste discharges to 10 CFR Part 20, Appendix B, effluent concentration limits are met by specifying flow rates at the blowdown sump discharge. The required minimum dilution factor is*

calculated and applied prior to release of liquid radioactive waste (batch is the only release mode anticipated)

Slide 6 *Because liquid effluent is released via deep well injection, there is no surface release; groundwater transport is the only exposure pathway*

- *Groundwater Modeling*
 - Radial Transport***
 - Vertical Transport***
- *Hydrogeology*
- *Well Failure*

Slide 10 *Model results*
Turkey Point Nuclear Plant Units 6 & 7
Groundwater Modeling Deep Well Injection

- ***300 ft vertical migration into Middle Confining Unit after 100 years***

These issues will be referred to below in the discussion of this contention. However, taken together, we can see that the slides tell us that decay of liquid radioactive waste in the supposedly confined Boulder Zone will occur involving slow movement over distance, that effluent (toxic chemicals from the reactor) will be diluted to meet standards for introduction into the aquifer, groundwater transport is the only exposure pathway including the radial and vertical transport (movement and that natural forces, hydrology will be at play and that there will be 300 foot vertical migration from the Boulder zone (the lower Floridan Aquifer) into the Middle Confining Unit (the Upper Floridan Aquifer) in 100 years.

CASE will show that the Boulder Zone, as the 100 year statement indicates, **is not confined** and that **movement will occur**, as the excerpt states, in all directions and that it will decay over time, not allowing for the

fact that the life of the reactors is 60 years with new radiological waste being introduced into the Boulder Zone every day so it will be a problem for at least 160 years.

As cited above, at 4, the Boulder Zone is a cavernous, high permeability South Florida geologic horizon located at depths of approximately 2,900 to 3,500 ft in the Lower Floridan Aquifer. Until waste water managers, municipal and private, in Miami-Dade County started forcing waste water, frequently raw sewage, into the Boulder Zone it was pristine and pure. No longer. High permeability means that water can flow within the 4,000 square mile Aquifer moving vertically and laterally in all directions. For example the EIS states, at 4-24:

Extraction of Groundwater during Dewatering of the Plant Excavations

*Because of the **high permeability** of some sediments in the Biscayne aquifer, FPL would control inflow of groundwater to the excavations by placing a low-permeability grout curtain around each of the excavations and injecting grout into the sediments below the plant excavation. The review team determined that FPL would take additional measures to reduce groundwater inflow if needed, such as additional grouting or sheet piles.*

Confining Layers Of The Biscayne Aquifer

Many local water managers will tell you that the Aquifers are strongly bounded and contained by thick confining layers but even an FPL engineer at the CASE Evidentiary Hearing for Turkey Point 3 & 4 in January, 2016 in Homestead, FL observed there was a flow of water upward between the lower Aquifers (Transcript at 247/248}

FPL expert Mr. Andersen testified as follows:

TRANSCRIPT January 11, 2016,

72 Mr. Anderson, FPL Staff

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at 434,

1 MR. ANDERSEN: Yes. I agree with

2 everything Bill is saying. In addition, too, that

3 **there is an upward hydraulic gradient from the**

4 **Floridan (Aquifer) to the Biscayne (Aquifer). The Floridan is under**

5 **pressure. Therefore, you have flow from the Floridan**

6 **into the Biscayne and not vice-versa.**

Thus, FPL's expert confirms that there is **upward connectivity** from the lower levels of the aquifer to the upper, as does the McNeill study below. When you consider the vast amounts of water which will be injected into the Boulder Zone not just from Turkey Point but from the MDCWS department and by private entities, we are really pushing nature to its limits without regard to the consequences. NEPA requires that all of these elements be taken into account. We do not see an in depth level in this EIS. Such analysis would only require checking the literature and available information on the nature of the Biscayne Aquifer and the land of which the Turkey Point wetland is a part.

Dr. Donald Mcneill (University Of Miami) wrote a report in 2000 looking at the same question for the South Miami Dade County Water Treatment Plant, the plant from which reclaimed waste water would be drawn. There, the presumed very thick low permeability zone was in fact only about 14 feet in thickness and lay just above the Boulder Zone at a thickness at a depth rising to 2456 to 1443 feet, the lower permeability toward the north west . Effluent injected from Turkey Point will flow up the surface's gradient to the Northwest and then probably North where it will have many opportunities to encounter breaks in the permeability barrier in this lateral travel. (McNeill, Donald F., 2000. A Review of Upward Migration of Effluent to Subsurface Injection at Miami-Dade Water and Sewer South District Plant. Prepared for Sierra Club - Miami Group. 30 Pp).

Thus, as these two studies show, there is no guarantee that the discharges of harsh chemicals into the Boulder Zone will stay put. It is more likely that they will migrate in all directions and, over time pose a threat to the entire Biscayne Aquifer which cover some 4,000 square miles in South Florida. Does the EIS address this possibility. CASE members live above this Aquifer and need the water to survive, to water crops (this area is the winter vegetable source for the entire nation) and, for freshwater to hold back saltwater intrusion. These are vary serious and existential potential harms from the operation of these reactors. A less than hospitable site. No one knows where it will go but every school kid in South Florida knows the 4,000 square Biscayne Aquifer is one big interconnected network.

From the EIS, at 5-21 to 5-29

Evaluation of Confinement of Injected Wastewater in the Saline Lower Floridan Aquifer

The EIS spends 8 pages on this subject; too much to reproduce here. But, it does seem to come under the category of "Methinks thou dost protest too much" The discussion clearly indicates that "up welling occurs" but, at 5-21, we read,

*In view of the above, the treatment that the reclaimed waste water will receive at the SDWWTP will provide protection to the USDW **even in the event of upwelling**. Confinement of the wastewater below the USDW, which is discussed below, will provide an additional level of protection.*

The discussion, all 8 pages of it, is so convoluted and internally contradictory and self-serving that it will really take an Evidentiary Hearing eventually to separate fact from fiction. CASE holds, as demonstrated in this petition, that "up welling" and, as FPL says above, vertical and horizontal movement of water from the Boulder Zone will occur. The consequences and impact, and even the fact of that as stated in the EIS,

was not fully evaluated or addressed by the review team or by the NRC Staff. And the full implications of placing liquid radiological waste in the Boulder Zone in any concentration must be exhaustively consider in the Petition and Hearing process; the scope of this project and NEPA require and demand no less.

WHAT IS THE NATURE OF LIQUID RADIOACTIVE WASTE (RADWASTE)

FROM THE EIS, at 3-34,

3.4.3.1 Liquid Radioactive Waste-Management System

*The liquid radioactive waste-management system would control, collect, process, handle, store, and dispose of liquid radioactive waste generated as a result of normal operations and anticipated operational occurrences, **including refueling operations**. The liquid radioactive waste-management system would be managed using several process trains consisting of tanks, pumps, ion exchangers, filters, and radiation monitors, and is shown in DCD Figure 11.2-1 (Westinghouse 2011-TN261). **Normal operations would include processing of (1) borated, reactor-grade wastewater, (2) liquids collected through floor drains and other liquid wastes with potentially high suspended solid contents, (3) detergent wastes, and (4) chemical wastes**. The liquid radioactive waste-management system would comply with Regulatory Guide 1.143 (NRC 2001-TN1134) regarding liquid radwaste-treatment systems.*

*In addition, the radioactive waste-management system could handle effluent streams that typically do not contain radioactive material, but **that may, on occasion, become radioactive** (e.g., steam generator blowdown as a result of steam generator tube leakage). With two exceptions, **liquid effluents processed through this system would become part of the liquid radioactive waste-management system***

effluent discharge. *The exceptions are steam generator blowdown that is normally returned to the condensate system after processing and reactor coolant that can be degassed prior to reactor shutdown and returned to the reactor coolant system.*

*As stated in DCD Section 11.2.1.2.4 (Westinghouse 2011-TN261), the liquid radioactive waste management system effluent would be stored in monitoring tanks prior to discharge. **Liquid radioactive effluent would be discharged to the deep-injection wells.** The discharge would be monitored and administratively controlled to ensure that it meets the requirements of 10 CFR Part 20, Appendix B, Table 2 Column 2 (10 CFR Part 20) (TN283). The radiological impacts from liquid effluents are evaluated in Section 5.9.*

Quite a soup; not exactly what you would want with “soup and a sandwich” and not a mixture which, as explained elsewhere in this petition, that you want released into water ways including the Boulder Zone which does, despite EIS statements to the contrary and conflicting EIS and non EIS statements of record, which show that the Boulder Zone does interact and connect with all parts of the 4,000 square mile Biscayne Aquifer and the Atlantic ocean to the east.

TRITIUM - Dangerous at any level

The EIS states in several places that Tritium would be present in effluent from the proposed reactors but that, at the levels expected, would not be harmful. Biologists and other scientists think other wise. A report *Tritium: Health Consequences*(Cindy Folkers, Nuclear Information and Resource Service, April 2006. we read, at 1,

*Tritium (symbol **T** or ^3H , also known as **hydrogen-3**)(3H))is a radioactive isotope of hydrogen; it gives off radiation in the form of a beta particle. Tritium will bind anywhere hydrogen does, including in water, and inplant, animal and human tissue. It cannot be*

removed from the environment once it is released. Tritium can be inhaled, ingested, or absorbed through skin. Eating food containing ^3H can be even more damaging than drinking ^3H bound in water. Consequently, an estimated radiation dose based only on ingestion of tritiated water may underestimate the health effects if the person has also consumed food contaminated with tritium. (Komatsu)

Tritium is primarily a byproduct of the nuclear power industry, which releases large amounts (megacuries) of tritium per year. (Dobson, 1979) Tritium has a half life of 12.3 years which means it will be dangerous for at least 120 years, since the hazardous life for a radionuclide is ten to twenty times longer than its half-life.

...

Most studies indicate that tritium in living creatures can produce typical radiogenic effects including cancer, genetic effects, developmental abnormalities and reproductive effects. (Straume) Tritium can cause mutations, tumors and cell death. (Rytomaa) Tritiated water is associated with significantly decreased weight of brain and genital tract organs in mice (Torok) and can cause irreversible loss of female germ cells in both mice and monkeys even at low concentrations. (Dobson, 1979) Studies indicate that lower doses of tritium can cause more cell death (Dobson, 1976), mutations (Ito) and chromosome damage (Hori) per dose than higher tritium doses. Tritium can impart damage which is two or more times greater per dose than either x-rays or gamma rays. (Straume) (Dobson, 1976)

There is no evidence of a threshold for damage from tritium exposure; even the smallest amount of tritium can have negative health impacts. (Dobson, 1974) Organically bound tritium (tritium bound in animal or plant tissue) can stay in the body for 10 years or more. While tritiated water may be cleared from the human body in about 10 days (Garland), if a person lives in an area where tritium

contamination continues, he or she can experience chronic exposure to tritium. (Laskey) Tritium from tritiated water can become incorporated into DNA, the molecular basis of heredity for living organisms. DNA is especially sensitive to radiation. (Hori) A cell's exposure to tritium bound in DNA can be even more toxic than its exposure to tritium in water. (Straume)(Carr)

Given this *Health Consequences* statement above, which tells us that “(t)here is no evidence of a threshold for damage from(Tritium) exposure; **even the smallest amount of tritium** can have negative health impacts. (Dobson, 1974) we should be alarmed when we read this statement in the EIS (at 5-26/5-27)) which confirms wide movement of water within the Boulder Zone and, therefore, present a pathway to spread Tritium widely:

Other Carcinogens

The EIS, at 5-123, states,

FPL's groundwater analysis determined that at the private land parcel location (Ocean Reef Yacht Club, 7.7 miles southeast) , the following maximum radionuclide concentrations occur in the following years after the start (i.e., model year 1) of deep-well injection:

- *tritium (H-3) 3.1E+04 pCi/L 25 years*
- *cesium-134 (Cs-134) 7.7E-03 pCi/L 15 years*
- *cesium-137 (Cs-137) 7.6E-01 pCi/L 42 years*
- *strontium-90 (Sr-90) 5.6E-04 pCi/L 41 years.*

So, in understanding the nature of what is contained in the liquid radiological waste which would be injected into the Boulder Zone, we must note the presence of cesium 134, cesium 137 and strontium-90 and their expect life spans which, for the last two, are much longer that tritium. These are very powerful carcinogens making the injection of liquid radio into the

Bolder Zone even more of a concern, frightening actually. This information deserves a much harder look than given in the EIS; NEPA requires this. The NRC staff did not, we must.

The EIS, at 6-26, discusses,

Extent of Injected Wastewater Migration at the Turkey Point Site

*Dausman et al. (2008-TN4757) modeled migration of two plumes from the SDWWTP of wastewater injected into the Boulder zone: ... The Dausman study concluded that over a projected 148-year injection period (from 1983 forward) the resulting plume would extend "...outward about 13 mi from the site in the MFA, just beneath the UFA." The MFA, or Middle Floridan aquifer, is another name for the APPZ. Modeling also indicates that the initial concentration of constituents in the plumes would be significantly reduced through dilution, to less than 5 percent of the original injected concentration by the end of the modeling timeframe. **This prediction of limited vertical and horizontal effluent migration***

is supported by modeling and analysis performed by FPL and independent confirmatory analysis performed by the review team. FPL provided information about modeling and analysis of several scenarios of potential upward migration of injectate (FPL 2013-TN3931) in support of the safety analysis of the proposed plants. The scenarios in the analysis focused on the fate and transport of radionuclides over a 61-year injection period followed by a 41-year period with no injection, and used conservative assumptions that would tend to maximize the upward migration of effluent. In each scenario, injected wastewater was predicted to expand radially around the point of injection since injection rates would exert a stronger influence on flow than the negligible flow rates naturally occurring within the Boulder

Zone. *Injected wastewater was not predicted to extend more than around 4 mi beyond the point of injection over the modeled timeframe. This is bounded by the transport distance of 13 mi predicted by Dausman et al. (2008-TN4757). The extent of migration resulting from injection at Turkey Point would be expected to be less because injection rates would be around 20 percent of those at the SDWWTP and the injection period would be less than half that which was modeled by Dausman et al. (60 years vs 148 years).*

This is only one of the many studies cited within the EIS which confirm the potential movement of water within the Boulder Zone but which the EIS minimizes as being significant or harmful ecologically. **By not fully evaluating the implications of toxic chemicals and even low levels of tritium, cesium and strontium 90 which will be introduced in the Boulder Zone, the EIS reaches dangerous and unsupported conclusions. We have read above that even low levels of tritium are harmful to all living things; there is no know bottom threshold.** Can it be more clear that an Evidentiary Hearing is required to openly address these critical issues before granting the COL? The Boulder Zone is not sealed. And 13 miles includes all of the winter vegetable crop for North America and most of the agricultural land and groves of the County.

Chemical Effluents From The Reactors

6.1.4 Chemical Effluents (EIS at 6-9)

*Liquid chemical effluents produced in fuel-cycle processes are related to fuel enrichment and fabrication, **and may be released to receiving waters.** These effluents usually are present in **dilute concentrations** so only small amounts of dilution water are required to reach concentration levels that are within established standards.*

This is obfuscation, pure and simple. In order to **circumvent** the established standards for chemicals from the reactors to be released into the water of the aquifer the applicant is planning to dilute it to meet the standards. But the impact is same. The chemicals will be introduced into the Boulder Zone and will eventually concentrate to otherwise illegal levels to wreak havoc on the South Florida ecology. One divided into two still equals one plus one. Two half teaspoons of arsenic still totals one teaspoon. It is not often that one tells you exactly how they will avoid the rules.

Liquid Radiological Waste From The Reactors

The most serious and potentially harmful issue CASE is presenting, and one which most concerns CASE members the most is the introduction of liquid radiological waste (radwaste) into the Boulder Zone as described in the follow citations from the EIS.

3.4.2.3 Injection Wells

*Cooling-tower blowdown water and other plant wastewater would be discharged to the deep Boulder Zone via Class I industrial injection wells. ... In addition to blowdown water from the cooling towers, waste water from the sanitary waste treatment plant, wastewater-retention basin, and **liquid radioactive waste-treatment system would be discharged to the Boulder Zone via the injection wells.***

...

3.4.4.2 Liquid-Waste Management.

*The expected nonradioactive liquid-waste streams include cooling-tower blowdown, water treatment wastes, discharge from floor and equipment drains, effluents from the sanitary treatment system, and stormwater runoff. ... **The plant design consolidates the nonradioactive liquid effluent streams from the CWS, the sanitary waste-treatment plant,***

and the wastewater-retention basin into the blowdown sump for discharge into the Boulder Zone via deep-injection wells.

Chemicals that would likely be added to the plant CWS, SWS, demineralizer water system, steam generator blowdown system, and reclaimed water-treatment facility include a biocide (sodium hypochlorite), pH adjusters (sulfuric acid, lime, carbonylhydrazide, hydrazine), proprietary scale inhibitors, a proprietary dispersant (high stress polymer), a coagulant (ferric chloride), and oxygen scavengers (sodium bisulfite, morpholine) (FPL 2014-TN4058)....

*After implementation of advanced treatment at the SDWWTP in FY 2013 (Miami-Dade County 2014-TN4758) additional sampling was performed to determine the concentrations of the constituents, **heptachlor, ethylbenzene, tetrachloroethylene, and toluene** in treated wastewater (NRC 2015-TN4773).*

The EIS states, 5-20

5.2.1.3 Boulder Zone

Hydrologic alterations affecting the Boulder Zone of the Lower Floridan aquifer would result from the injection of up to 90 Mgd of blowdown water and other liquid waste streams from the proposed units. The injected water would include effluent from the sanitary waste-treatment plant, wastewater-retention basin, **and liquid radwaste (radiological waste)** treatment system. The estimated injection rate is approximately 20 Mgd when only reclaimed water is used as a cooling-water source, as high as 90 Mgd when only saltwater from the RCWs is used, and between 20 Mgd and 90 Mgd if a combination of these water sources is used (FPL 2014-TN4058). However, the review team has determined that **since reclaimed water will be the primary source** injection rate higher than 2 MGD will occur only on rare occasions and for short durations.

There are some disturbing statements here. **Liquid Radwaste?** Into the Boulder Zone? Our members probably have not even heard of that and, when they do, it will scare the daylight out of them. Even small, diluted amounts of radioactive waste will accumulate and concentrate radiation which is not confined like water and can be absorbed by plant life.. In emails to CASE, Dr. Philip Stoddard, Biologist, University of Florida, Miami, Florida, referred to this report: *Fukushima's radioactivity found in California kelp; levels spiked, then disappeared.* (Environmental Health News, March 30, 2012, by Maria Cone).

*LONG BEACH, Calif. – Kelp off Southern California was contaminated with short-lived radioisotopes a month after Japan's Fukushima accident, a sign that the spilled radiation reached the state's coastline, according to a new scientific study. Scientists from California State University, Long Beach tested giant kelp from the ocean off Orange County and other locations after the March, 2011 accident and detected radioactive iodine, which was released from the damaged nuclear reactor. The largest concentration was 250-fold higher than levels reported in West Coast kelp before the accident. "Basically we saw it in all the California kelp blades we sampled," said Steven Manley, a Cal State Long Beach biology professor who specializes in kelp. The radioactivity had no known effects on the giant kelp, or on fish and other marine life, and it was undetectable when the kelp was tested again a month later. Iodine 131 "has an eight-day half life so it's pretty much all gone," Manley said. **"But this shows what happens half a world away does effect what happens here. I don't think these levels are harmful but it's better if we don't have it at all."***

Right. From 5400 miles away, not harmful. And this study focuses on Kelp; others report similar findings with other sea life in Southern California. But if you create a radiological source inside of the South Florida aquifer system and add to it 24/7, day after day, year after year, that is quite

different. Dr. Stoddard describes the mechanism for the radwaste from the proposed reactors to move from the Boulder Zone to local flora and fauna. "If / when / where our Boulder Zone water merges with the ocean, sargassum kelp could, conceivably, do the same thing." The USGS GROUND WATER ATLAS of the UNITED STATES (Alabama, Florida, Georgia, South Carolina HA 730-G) confirms this possibility:

*The Boulder Zone has been used for years to store vast quantities of treated sewage injected into it by Miami, Fort Lauderdale, West Palm Beach, and Stuart. Because the salinity and temperature of the water in the Boulder Zone are similar to those of modern seawater, **the zone is thought to be connected to the Atlantic Ocean**, possibly about 25 miles east of Miami where the sea floor is almost 2,800 feet deep along the Straits of Florida.*

In the discussion of pathways for liquid radiological waste discussed in the EIS at 5.9.2.1 (Page 5-115/116) **no mention is made of this possible pathway.** If it has already been seen in kelp, what if it migrates into the fruits and vegetables grown nearby for the whole nation; it could wipe out the industry. What are we doing?

The EIS states,

5.9.2.1 Liquid Effluent Pathway

Treated liquid radioactive waste from operations at proposed Turkey Point Units 6 and 7 would be discharged to the plant sump prior to ultimate release to the Boulder Zone via the UIC wells (see Figure 5-6). As discussed in Sections 2.3.1.2, 3.3.1.6, and 5.2.1.3 of this EIS, the highly saline Boulder Zone of the Lower Floridan aquifer is used for deep-well injection of treated municipal wastewater and reverse osmosis concentrates in Miami-Dade County. Injection occurs below the middle confining layer at depths of approximately 2,700 ft or more, approximately 900 ft below the base of the lowest

USDW. The Boulder Zone is currently not a source of potable water and there is no viable pathway for the injection well releases to reach potable water. Hence, there is no liquid effluent pathway dose that results from normal plant operations.

Potable water impact is not relevant this discussion. CASE rejects these conclusions and has show above that there are pathways from each level of the aquifer, especially upward, and there is movement in all directions within the 4,000 mile South Florida aquifer and into the ocean. And, as Dr. Stoddard observed, and the USGS Atlas states, the Boulder Zone eventually interacts with the ocean so that whatever is dumped there, treated or untreated, by FPL or MDCWS or any other party, toxic chemical, as well as radiological material and radiation itself, will eventually be dispersed throughout the area. And the waste water from the reactors is either not treated or is minimally treaded.

As described in Contention 1, it is very likely that reclaimed water, at some point might not be available so higher volumes of seawater will be injected into the Boulder Zone creating greater opportunity to move toxic chemicals and radwaste in all directions. Not good. And this option was not a part of the EIS analysis. Even small amounts of toxic matter accumulated over time can do great harm.

*I shot an arrow into the air,
It fell to earth, I knew not where;
For, so swiftly it flew, the sight
Could not follow it in its flight.*

HENRY WADSWORTH LONGFELLOW

CONTENTION FOUR

4) NEPA WAS NOT FULLY HONORED IN SPIRIT OR LETTER BY THE NRC STAFF WHICH APPROVED MEASURES HARMFUL TO THE ENVIRONMENT

The NEPA (National Environmental Policy Act 42 U.S.C. §§4321-4370 guidelines provide the preparers of an EIS with specific actions which

must be included in it. The Purpose, as stated in the Act, is a clear, noble and eloquent assertion by the framers to convey the seriousness of NEPA considerations and sets high standards of thoroughness and analysis. Calvert Cliffs' (Calvert Cliffs Coordinating Committee v. United States Atomic Energy Commission 449 F.2d 1109 (D.C. Cir. 1971) established an agency's obligation to comply with

NEPA to the fullest extent possible. The court was asked to review rules promulgated by the Atomic Energy Act on NEPA implementation and noted that NEPA makes environmental protection a part of the mandate of every federal agency and department. Agencies are

"not only permitted, but compelled to take environmental values into account. Perhaps the greatest importance of NEPA is to require [all] agencies to consider environmental issues just as they consider other matters within their mandates."

- *The Appellate Court noted that NEPA §102(2)(E) requires that all Federal agencies must considered NEPA "to the fullest extent possible."*
- *The Appellate Court found that compliance "to the fullest extent possible" demands that environmental issues be considered at every important stage of the decision-making process.*
- *The preparation of the EIS must be more than simply a pro forma ritual.*

It would appear that many NEPA requirements were either not fully considered or were ignored totally in the EIS. As stated several times above in this petition, many the impact of the authorized actions required to operate the proposed reactors have only been evaluated through computer modeling, for which the authors relate a high degree of uncertainty. No field research or studies specifically related to this monumental project were reported. A thorough evaluation of a \$20 billion project (Miami Herald MAY 17, 2016) would seem to demand such studies and the research team

intimated that course considering the frequent paucity of its support for the NRC staff decisions.

NEPA: HEALTH AND WELFARE OF MAN

Sec. 2 [42 USC 4321]. The purposes of this Act are: (to) eliminate damage to the environment and biosphere and stimulate the health and welfare of man;
While FPL's letter of August 27, 2014 to the SFWMD

How could anyone with any understanding of natural forces condone the injection of toxic chemicals and liquid radiological waste into a the rare and precious Boulder Zone in South Florida. For what purpose; to what end? What is so necessary for the welfare of man to merit it? Is energy so difficult to produce and are the ways of producing it so limited?. If it were not driven by economics would this be done? Gas, solar, wind, and geo-thermal are commonly understood to be much less intrusive and invasive for the environment. How does this square with the state purpose of NEPA:

Comments regarding the Calvert Cliffs case, cited above, tell us:

- *The Appellate Court noted that NEPA §102(2)(E) requires that all Federal agencies must considered NEPA "to the fullest extent possible."*
- . *The Appellate Court found that compliance "to the fullest extent possible" demands that environmental issues be considered at every important stage of the decision-making process.*
- *The preparation of the EIS must be more than simply a pro forma ritual.*

With authority comes responsibility. When an applicant presents a plan for any project to a government agency it must be dealt with at arms length and objectively. There are no favorites and no accumulation of fraternal influence. The government should represent only the best interests of the people. NEPA speaks to that as a reminder of that role while recognizing human nature and how business works in government; maintaining objectivity is very difficult, but it must be the standard.

NEPA: CONSIDER ALTERNATIVE ACTIONS

NEPA states:

Sec. 102 [42 USC 4332] (2):

(C) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on --

(iii) alternatives to the proposed action,

The Final Report EIS did a detailed analysis of alternative sources of energy. None matched nuclear, but is this surprising coming from the Nuclear Regulatory Commission. Perhaps such decisions as to the proper form of energy for any given location should be made at a higher governmental level which considers exactly that. NEPA would seem to speak to such an objective evaluation. The role of the NRC is not to foster nuclear energy but to regulate its safe and environmentally friendly use. Lincoln envisioned America's representative democracy: ... "government of the people, by the people, for the people..." Bureaucracies do not always remember this; NEPA requires that they do.

Reading the section 4.2.1.1 Biscayne Bay, Hydrological alterations to Biscayne, made this writer physically nauseous at the draconian insult to the rare and precious Turkey Point Wetland and the surrounding area. Just the measures required to clear the barge channel, dredging and pumping

billions of gallons of water upsetting hallowed fishing grounds for anglers and fly fishers. The report that rock mining of almost 500 acres of farmland has been authorized when the Miami-Dade Master Plan says there should be no net loss of agricultural land. We read at 4.2.1.1 (Page 4-21):

Concerning the potential effect of direct surface drainage from spoils disposal piles on Biscayne Bay during building of proposed Turkey Point Units 6 and 7, the review team is unaware of any reason that would preclude the use of engineering design solutions to prevent drainage into the C107 Canal, which would be the only potential direct surface-water pathway into Biscayne Bay.

Of course the review team is unaware of any reason that would preclude this action. They and the NRC staff do not live here. They only come in for a few hours and leave. No one who has connected with the natural beauty and the pastoral peace of southern Miami-Dade County could even conceptualize such gross insults to the land and water as described heartlessly in these passages on construction. Reading the following passage, at 4-23, is, for CASE members, like turning a screw into one's stomach:

Excavation of Fill Material

*As discussed in EIS Section 3.2.2.3, up to about **14.4 million cubic yards of fill material** would be needed to raise the ground-surface elevation of the proposed plant area and facilities associated with proposed Units 6 and 7. FPL has not made a final determination regarding the source of the fill material for the FPL site; however, FPL has indicated that it would use commercial fill sources in the vicinity of the Turkey Point site.*

The EIS, at 9-2:

9.1 No-Action Alternative

Some preconstruction impacts associated with activities not within the NRC's definition of construction at 10 CFR 50.10(a) (TN249) and 10 CFR 51.4 (TN250) may occur nonetheless. However, no activities, including preconstruction activities, involving the discharge of dredged or fill materials into waters of the United States or work in navigable waters of the United States, could occur without a DA permit from the USACE. If no other power plants were to be built in lieu of the proposed project or other strategy implemented to take its place, the benefits of the additional electrical capacity and electricity would not occur (and the required baseline power need would not be met)

The EIS at 9-30 to 9-33, provides in 9.2.5 Summary Comparison of Alternatives a comprehensive review of the EIS positions and reasoning. CASE submits that the omission of the decentralized, distributed production of energy at the point of use including solar, wind and geothermal energy is a major shortcoming of the EIS; NEPA would require inclusion of these emerging and evolving technologies. They would reduce the need for additional powerlines which the EIS cites several times as being required by other alternative energy source even though the EIS discusses new powerlines for the planned units. The rate of installation of power on homes and businesses is increasing rapidly while the cost, driven by advancing technology, is dropping like a stone. Unfortunately, FPL is tied to the business model of increasing the amount of invested capital on their balance sheets, paid for by their rate payers, so FPL can enjoy a guaranteed 10.5% return on invested capital. They have yet to figure out that, if they installed and leased renewable energy plants they would own them and could enjoy the guaranteed return on investment. Renewable energy in Florida alone could add \$200 billion in new GDP of which FPL could receive a good portion, but not with their current business model. CASE attempted twice to meet with FPL senior management to discuss these ideas but they would not do so because CASE opposes energy production at Turkey Point.

Looking at the environmental impact of this gargantuan project, one must ask: Are these insults to the land in the letter and spirit of NEPA. Quite the opposite; it was what the authors of NEPA were trying to prevent. But once your assumption is that no other location or source of power would meet the applicant's stated needs, any alternative is off of the table. The actions described in 4-23 to 4-27 will scar, deface and upset the land forever. An environmental win is one time; an environmental loss is forever. Is there no alternative to directly and indirectly destroying the pastoral beauty of the area above and below ground? CASE members believe that there are many. If the applicant put the same creativity and energy into that direction as they invested in this project, it would be environmentally and economically beneficial for them and for Florida.

As the use of renewable energy increases, and as energy efficiency and conservation improve, and the cost, already economically advantageous for the use (especially with FPL rates increasing January 1, 2017), the role of the power grid will be mainly for conductivity. This will reduce demand for centralized production of energy and should have been figured into the EIS.

The EIS states,

9.2.1.3

Summary Statement Regarding Alternatives Not Requiring New Generating Capacity

improved energy efficiency and demand-side management (DSM) strategies can potentially cost less than construction of new generation and provide hedge against market, fuel, and environmental risks. (emphasis added)

NEPA: LONG TERM PRODUCTIVITY/RESOURCES

NEPA states:

Sec. 102 [42 USC 4332] (2):

- (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of longterm productivity, and
- (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

The authors of NEPA must have had the Turkey Point Wetland and South Florida in mind when they drafted this part of the regulation. The EIS does address several long term issues created by this project, and 160 years is indicated, but not to the extent merited when, admittedly, direct influence of the effluent from the operation of the reactors will not only be present for that time period, but will influence and impact the ecology for far beyond. And certainly, the possibility that liquid radiological waste could, as explained at 25 to 30, move throughout the aquifer, even out into the ocean, to rise and return to the land on or below the surface to impact flora and fauna, and the land itself. The 4,000 square mile Biscayne Aquifer is interconnected; there is no where for toxic matter to hide; it will have an influence in many places and on all forms of life for many years. And it will require vast amounts of natural resources to build. So, NEPA would require that we pause and ask, "is this trip necessary?" Is the production of energy worth the use and destruction of the natural resources and the land for short term gain? The quality of life, and even life itself, are threatened by this project. That is worth a full accounting and evaluation. CASE members and the First Amendment require this.

CONCLUSION

As CASE has shown, the entire EIS is replete with admonitions from the review team, too many to cite in this petition, regarding the environmental uncertainties in predicting the impact of the operation of the proposed reactors on one of the most fragile and unique wetlands on the planet. Reclaimed water might not be available, the ultimate impact of with drawing billions of gallons of sea water from the aquifer is not clear and the impact of injecting toxic chemicals and radwaste in the Boulder Zone is unknown, untested, and frightening. NEPA requires a more thorough and considered analysis.

It was a mistake to produce energy at Turkey Point in the first place and to continue to do so in the manner proposed is irresponsible and self-serving. Economics does not trump ecology especially when the quality of life of the residents and the viability of the land is at stake. The EIS is internally contradictory and the conclusion of the NRC staff does not follow from the information provided by the review team. Is it beyond the realm of possibility that the NRC staff could really read the EIS objectively and determine that this is the wrong place for these units? Everyone in South Florida, except for those with a financial interest in them, understands that. Admitting CASE's Contentions and reviewing these matters in a hearing could prevent a serious mistake and save CASE's members' from harm while restoring and preserving this slice of Paradise for their descendants.

Executed in Accord with 10 CFR § 2.304(d).

Respectfully submitted,

/S/ (Electronically) Barry J. White

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305-251-1960

Dated at Miami, Florida
this 28th day of November, 2016

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
BEFORE THE COMMISSION

In the Matter of)
)
FLORIDA POWER & LIGHT COMPANY) Docket Nos. 52-040
) and 52-041
(Turkey Point Nuclear Generating)
Units 3 & 4))

CERTIFICATE OF SERVICE

I, Barry J. White, hereby certify that copies of the foregoing CITIZENS ALLIED FOR SAFE ENERGY PETITION TO INTERVENE AND REQUEST FOR A HEARING IN OPPOSITION TO THE FINAL REPORT EIS GRANTING COL'S FOR TURKEY POINT UNITS 6 & 7 have been submitted to the Electronic Information Exchange.

Executed in Accord with 10 CFR § 2.304(d).

Respectfully submitted,

/S/ (Electronically) Barry J. White

Barry J. White
Authorized Representative
Citizens Allied for Safe Energy, Inc.
10001 SW 129 Terrace'
Miami, FL 33176
305-251-1960

Dated at Miami, Florida
this 28th day of November, 2016



PARTY LIKE YOU ARE IN RIO. CELEBRATE NEW YEAR'S EVE
IN-STYLE AT THE FIVE STAR NYE'S ALL WHITE PARTY



FPL Wants to Store Radioactive Waste Under Our Drinking Water Supply

BY JERRY IANNELLI

WEDNESDAY, DECEMBER 7, 2016 AT 11:07 A.M.



The Turkey Point nuclear power plant in South Miami-Dade, circa 1974.

[Photo by Energy.gov / Wikimedia Commons](#)

Florida is basically one gigantic hunk of porous limestone with pythons, buildings, and Medicare frauds sunning themselves on top. Underneath is South Florida's main source of drinking water, the Biscayne Aquifer, a pristine pool of underground liquid that's become increasingly susceptible to pollution and saltwater intrusion.

Just below that sits another, deeper store of H₂O called the Floridan Aquifer. Thanks to that porous limestone, water sometimes mixes between the two.

And that's why it's more than a bit alarming that Florida Power & Light (FPL) is pushing ahead with plans to inject radioactive waste into the Floridan Aquifer's lowest zone over the next few decades, after building two new nuclear reactors in South Florida. Environmentalists contend the plan could leak carcinogens such as cesium, strontium 90, and tritium right into South Florida's largest drinking water source.

Last week, a nonprofit environmentalist group that has frequently sparred with FPL, the Citizens Allied for Safe Energy (CASE), filed a formal petition to hold a hearing to stop the utility company's plan. The group filed November 28 – FPL now has 25 days to respond to the complaint.

"Everything will be put into a supposedly 'hermetically sealed' boulder zone," CASE's president, Barry J. White, says, "but anybody who lives in South Florida knows nothing below us is hermetically sealed."

An FPL spokesperson, Peter Robbins, provided the following statement to *New Times*:

After an exhaustive and comprehensive review of the proposed Turkey Point Units 6 & 7 project, including the plans to safely use reclaimed water for cooling, the independent Nuclear Regulatory Commission's staff concluded "...there are no environmental impacts to preclude issuing Combined Licenses to build and operate two reactors next to the existing Turkey Point nuclear power plant."

We will be reviewing the allegations made by CASE in this document, which was filed after the Environmental Impact Statement was issued, and will respond at the appropriate time. It's important to note that the system will be closely monitored and is designed to ensure that upward flow from the Floridan Aquifer is not taking place.

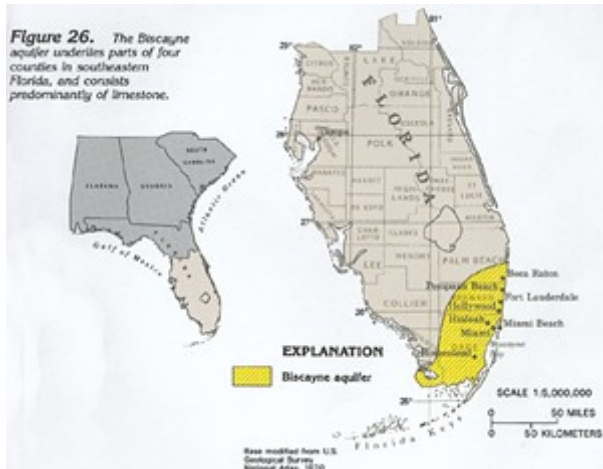
But the radioactive-waste issue is just the latest flap for the utility monopoly. FPL recently won a yearlong fight to raise customer rates by \$811 million despite turning a \$1.6 billion profit last year. The company **also wasted \$8 million on a failed plan to deceive voters and make it harder for them to obtain solar panels for their homes.**

FPL's parent company also partly owns the Sabal Trail pipeline, which, if built, will controversially run from central Alabama, through Georgia, and down to Orlando. **Protest camps have sprung up in three Florida cities to stop the pipeline's progress.**

The new radioactive-waste fight stems from FPL's long-standing plan to expand the much-ballyhooed nuclear plant at Turkey Point. The power company – a "legalized monopoly" within Florida that's long been accused of buying off the state Legislature with campaign cash – wants to build two new reactors, numbers 6 and 7, at the plant over the next decade or two.

Earlier this year, Miami-Dade County officials said Turkey Point is almost certainly leaking radioactive waste into Biscayne Bay, though at levels that most scientists agree is safe for humans. After that news broke, FPL decided to postpone building the new reactors for four more years. That means the **new towers won't be operational until roughly 2030**.

But the extended timeframe doesn't mean Miamians can stop paying attention to the project. FPL is applying for licenses to build the new towers, as well as crafting a host of plans to get the new wing operational. This includes a review from the U.S. Nuclear Regulatory Commission (NRC), which issued an environmental impact statement in May.



The Biscayne Aquifer

United States Geological Survey

As part of that plan, FPL says it plans to stash chemicals used to clean the reactors, as well as "radwaste" – waste that contains radioactive material – inside the so-called boulder zone. The zone, which sits about 3,000 feet below ground, is mostly rocky but does contain saltwater. Miami-Dade County has used the zone before to stash both treated and untreated sewage – but activists say that's no excuse for placing radioactive waste there.

"Two wrongs don't make a right," White says. "I've always opposed dumping anything there."

The feds must approve FPL's plan under a law called the National Environmental Policy Act, which stipulates that governmental agencies must take a "hard look" at any possible risks a plan like FPL's would pose. (The "hard look" provision is legally vague and sparks frequent fights among environmentalists, energy companies, and the government.) FPL initially applied to build the new reactors in 2009, but the government issued its final Environmental Impact Statement only **this past October**. The NRC allowed the project to move forward.

But CASE says the government ignored a number of small but frightening details when it comes to storing radioactive waste underground: For one, government documents themselves say the Floridan's boulder zone could possibly leak into the ocean.

According to CASE's complaint, the United States Ground Water Atlas, a government document, warns that the boulder zone "is thought to be connected to the Atlantic Ocean, possibly about 25 miles east of Miami, where the sea floor is almost 2,800 feet deep along the Straits of Florida." CASE's petition says the NRC failed to address this issue.

"Liquid Radwaste? Into the Boulder Zone?" the petition says. "Our members probably have not even heard of that and, when they do, it will scare the daylight out of them. Even small, diluted amounts of radioactive waste will accumulate and concentrate radiation which is not confined like water and can be absorbed by plant life."

More frightening, in January 2016, in a hearing related to Turkey Point Reactors 3 and 4, FPL's own engineer testified that the boulder zone could leak upward into the Biscayne aquifer – AKA, Miami-Dade's drinking water.

MR. ANDERSEN: Yes. I agree with everything Bill is saying. In addition, too, that there is an upward hydraulic gradient from the Floridan [Aquifer] to the Biscayne [Aquifer]. The Floridan is under pressure. Therefore, you have flow from the Floridan into the Biscayne and not vice versa.

Likewise, CASE cited a 2000 University of Miami study that also warned that material injected into the boulder zone can float to the surface.

"Effluent injected from Turkey Point will flow up the surface's gradient to the northwest and then probably north, where it will have many opportunities to encounter breaks in the permeability barrier in this lateral travel," the petition says.

CASE says the NRC failed to investigate either of these issues as well.

"Thus, as these two studies show, there is no guarantee that the discharges of harsh chemicals into the boulder zone will stay put," CASE warns. "It is more likely that they will migrate in all directions and, over time, pose a threat to the entire Biscayne Aquifer, which covers some 4,000 square miles in South Florida."

White, who wrote the petition, faults FPL for clinging to a 20th-century business model too reliant on fossil fuels and nuclear energy.

"They have ignored the potential of a different business model," White says. In his petition, he claims that the state could add \$200 million in GDP from renewable energy sources – and that FPL could rake in a huge cut of that money if it commits to building clean energy sources.

CASE also raised three other major issues with the new reactors, including that the two towers might suck far too much freshwater from the state's aquifers.

"Our organization's whole objective is to return Turkey Point to being a wetland," White says. "We don't need it to be totally clear. They can put solar array down there. I wouldn't even mind if they used gas. But they need to do it without impinging on the needs of the land."

If the NRC doesn't listen, he says, his next step will be to try to get the attention of the Florida Legislature.

"People have injected this waste into the land before, but not into a flowing body of water like this," he says. "How anybody who has an iota of conscience can put radioactive waste into a body of water that humans and animals use, it's like, 'Are you crazy? What are you doing?'"

Here's CASE's full petition:

[Please read web version for embedded PDF]

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