NRC-010

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Combined License Application Mandatory Hearing Florida Power & Light Company Turkey Point Units 6 and 7

- Safety Panel
- December 12, 2017

United States Nuclear Regulatory Commission Official Hearing Exhibit			
In the Matter of:	FLORIDA POWER & LIGHT CO. (Turkey Point Nuclear Generating Units 6 and 7)		
	Commission Mandatory Hearing		
	Docket #: 05200040 | 05200041		
	Exhibit #: NRC-010-MA-CM01	**Identified:**	12/12/2017
	Admitted: 12/12/2017	**Withdrawn:**	
	Rejected:	**Stricken:**	
	Other:		

Panelists

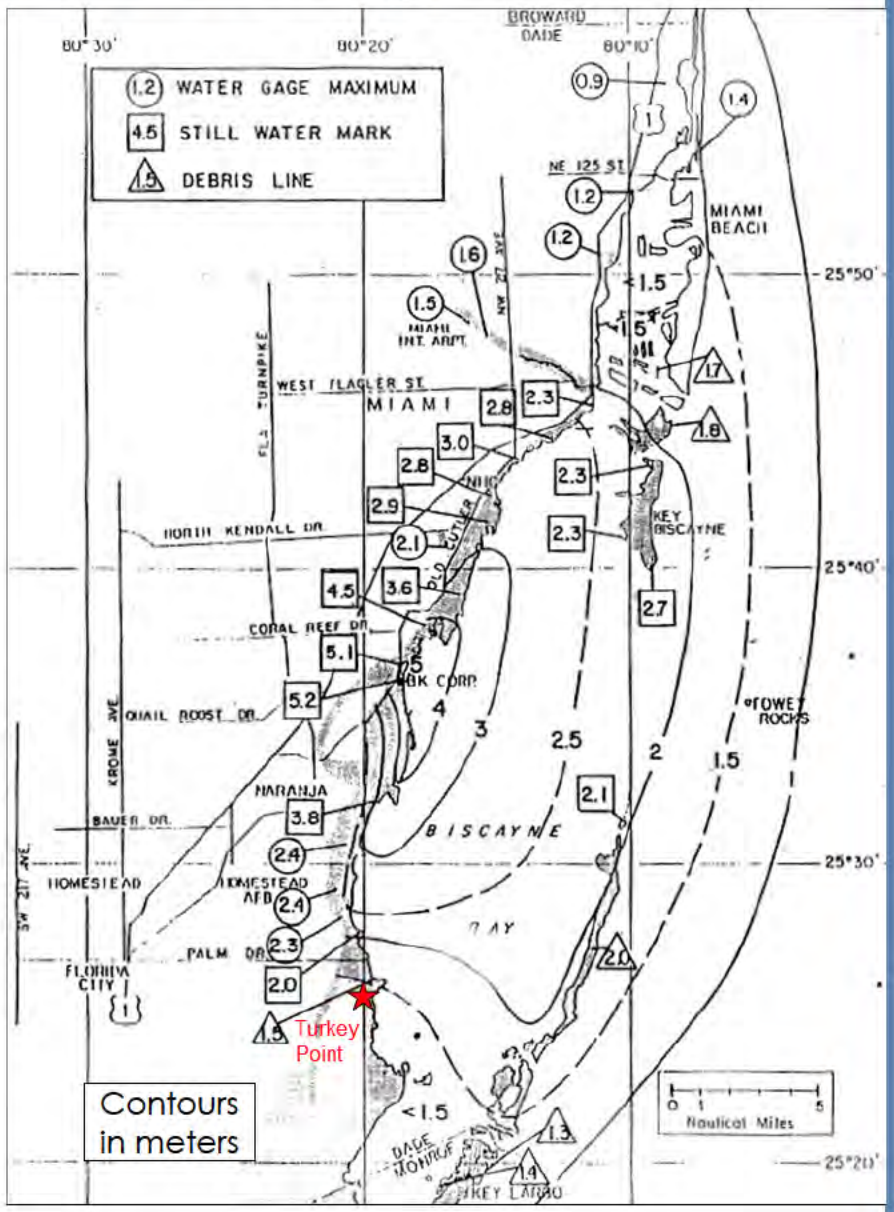
- Manny Comar – Senior Project Manager, NRC
- Joseph Giacinto – Lead Hydrologist, NRC
- Zachary Gran – Health Physicist, NRC
- Ellen Smith – Hydrologist, ORNL

Safety Panel Topics

- Storm Surge and Sea Level Rise
- Deep Well Injection for Liquid Radioactive Waste Disposal

Historical Storm Surge

- Hurricane Andrew made landfall 8 miles north of site in 1992.
- Category 5 storm
- Remains highest Florida storm surge on record:
  - 15.4 ft 8 miles north of site
  - 3-4 ft at the site



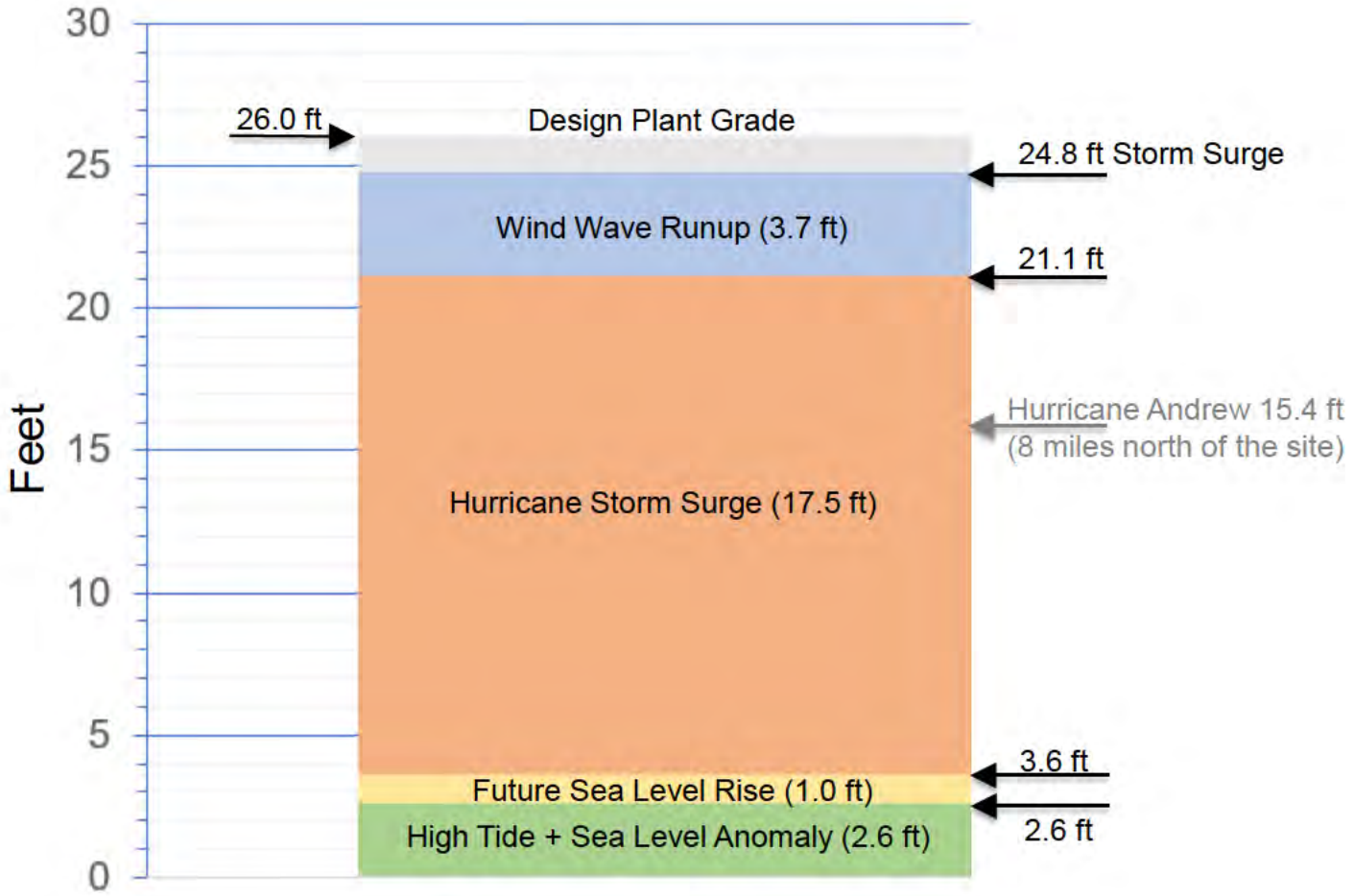
Storm Surge Components

- Used combination of Probable Maximum Hurricane parameters that results in highest storm surge
- Added 20 percent to predicted surge
- Additional conservative assumptions
  - Extreme high tide, sea level rise, wind and waves
- Estimated storm surge of 24.8 ft
- Design plant grade of 26.0 ft

Sea Level Rise in the Storm Surge Analysis

- NRC guidance was followed.
- NOAA-derived linear trend for Miami Beach data: 0.78 ft rise in 100 years
- Miami Beach gauge taken out of service in 1981—Key West gauge data from 1913 until 2016 show a consistent trend
- Analysis includes 1.0 ft rise to year 2100
- Sea level rise is observable and gradual.

Storm Surge Components



Staff Storm Surge Conclusions

- Estimated storm surge is beyond historical extremes.
- Multiple conservatisms appropriately account for uncertainty.
- The design basis flood level from storm surge is appropriately conservative.
- The design-basis flood level does not reach the design plant grade.

Deep Well Injection

- FPL is proposing to use Deep Well Injection to dispose of liquid effluent releases.
- First use of such disposal by a nuclear power plant in the USA
- 10 CFR 20.2002 describes the methods for obtaining approval of proposed disposal procedures.

Background – Deep Well Injection

- Injection into the Boulder Zone of the Lower Floridan aquifer (approximately 3000 feet deep)
- The Boulder Zone of the Lower Floridan aquifer is separated from the Upper Floridan Aquifer by the approximately 1500 ft thick Middle Confining Unit (MCU) which will prevent upward migration.

Background – Deep Well Injection

- Approximately 180 FDEP Class I Underground Injection Control (UIC) wells from various industries permitted in Florida

- FPL proposes 12 Class I UIC wells and 6 dual-zone monitoring wells for Turkey Point Units 6 and 7.

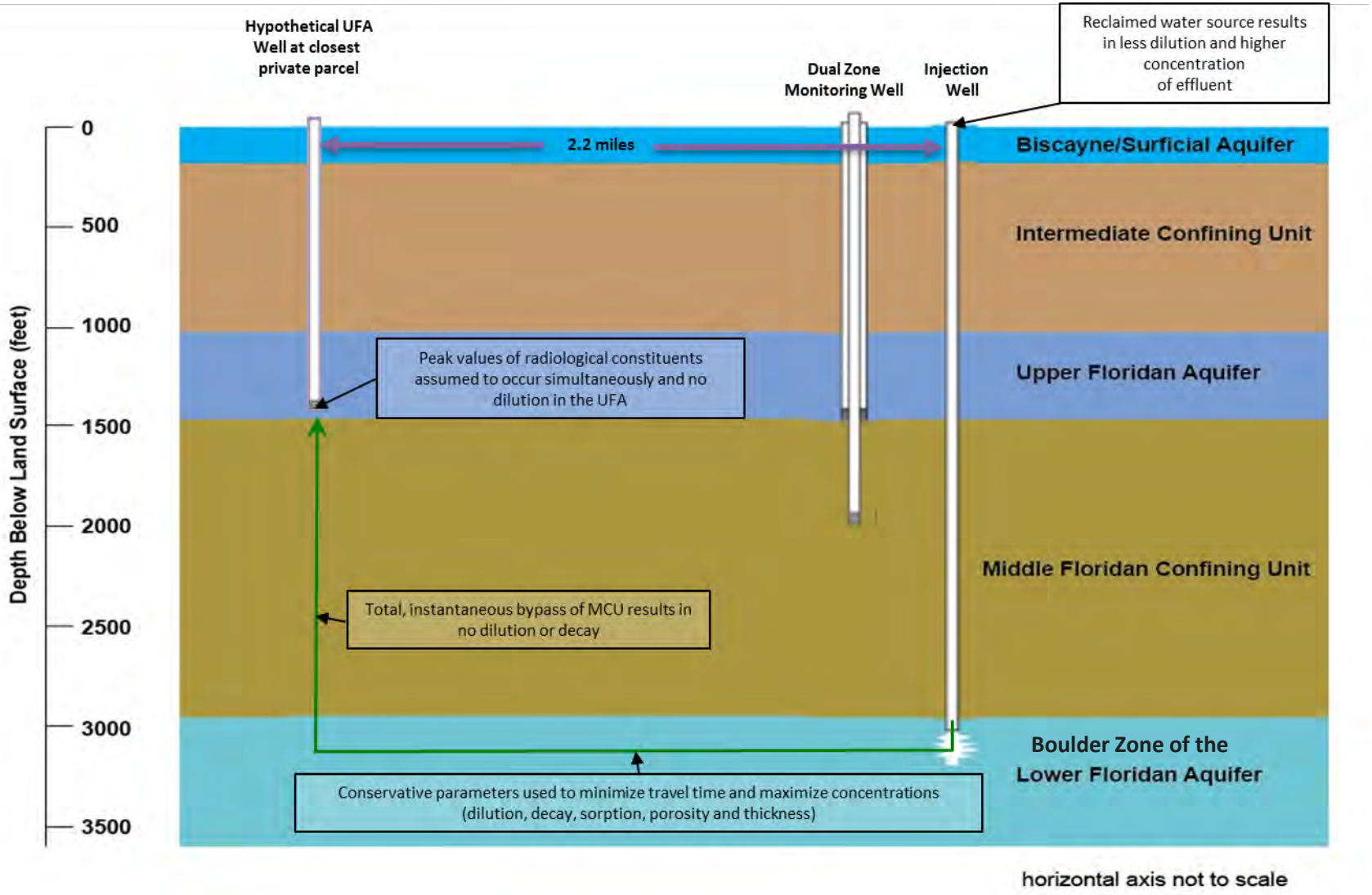
Staff Analysis

- Staff typically approves 10 CFR 20.2002 requests that will result in a dose to a member of the public (including all exposure groups) that is no more than "a few millirem/year".
  - SECY-07-0060 and NUREG-1757, "Decommissioning Process for Materials Licensees"
  - Criteria in 10 CFR Part 50, App. I, used for suitable criteria for evaluating dose

Staff Analysis

- Independent dose analysis using the concentrations described by FPL. Staff Analysis considered:
  - H-3, Cs-134, Cs-137, and Sr-90
  - Nearest hypothetical receptor at 2.2 miles NW
  - Irrigated food pathways of vegetables, milk, meat, and drinking water as potential pathways for dose
  - Assumed full breach of the MCU

Injection Scenario



Staff's Conclusions

- Based on the conservative assumptions stated by staff, the releases were determined to be in compliance with:
  - 10 CFR Part 20 Appendix B
  - 10 CFR Part 50 Appendix I
  - 10 CFR 20.2002

Acronyms

- CFR – Code of Federal Regulations
- Cs – Cesium
- FDEP – Florida Department of Environmental Protection
- FPL – Florida Power & Light Company
- GDC – General Design Criterion
- H-3 – Tritium
- MCU – Middle Confining Unit

Acronyms

- NOAA – National Oceanographic and Atmospheric Administration
- ORNL – Oak Ridge National Laboratory
- PMH – Probable Maximum Hurricane
- Sr – Strontium
- UFA – Upper Floridan Aquifer
- UIC – Underground Injection Control