Turkey Point Units 6 & 7 Nuclear Project

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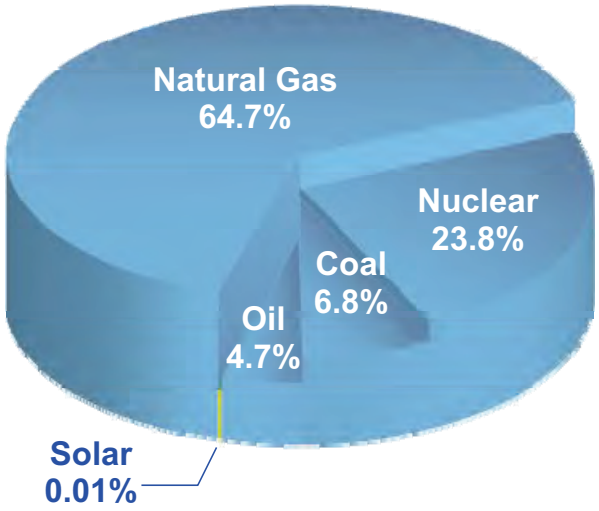
FPL is a leader in energy and conservation programs as well as renewable generation, part of a combined strategy to meet the needs of our customers

Nuclear Generation: Three Critical Benefits

- **Fuel Diversity**
  - Maintaining the reliability of our system requires a balance of fuels
- **Meaningful reductions of Greenhouse Gases**
  - Achieving reduction goals will require multi-prong approach
  - Avoids future carbon costs
- **Reasonably priced power**
  - Low and stably-priced fuel provides significant savings compared to natural gas

FPL Generation (MWH) by Fuel Type



Turkey Point Units 6 & 7 was designed at the outset to avoid impacts, and enhance the environment of the region by making specific design choices

Turkey Point Units 6 & 7: Designed to Fit

- **Location**
  - Use of an existing site and leveraging installed infrastructure avoids new impacts
- **Transmission**
  - Maximize use of existing transmission Rights-of-Way and pro-actively address unavoidable impacts
- **Water Resources**
  - Use reclaimed water for cooling
  - Employ innovative technology as backup
- **Experience**
  - FPL has successfully operated at Turkey Point for 40 years

FPL

The project's water features are an example of positive collaboration and consideration of community priorities that resulted in creative design features

Cooling Water at Turkey Point

Nine miles of pipeline would carry reclaimed water from the Miami-Dade County South District Wastewater Plant

Miami-Dade County reclaimed water is the primary cooling source

- Cost-effective
- Lessens amount of water needed
- Reduces County's waste water disposal

Cooling towers reduce volume needed as water recirculated is to be used multiple times

Radial collector wells provide the back-up for reliability of operations

- Low cost
- Reliable
- Low environmental impact

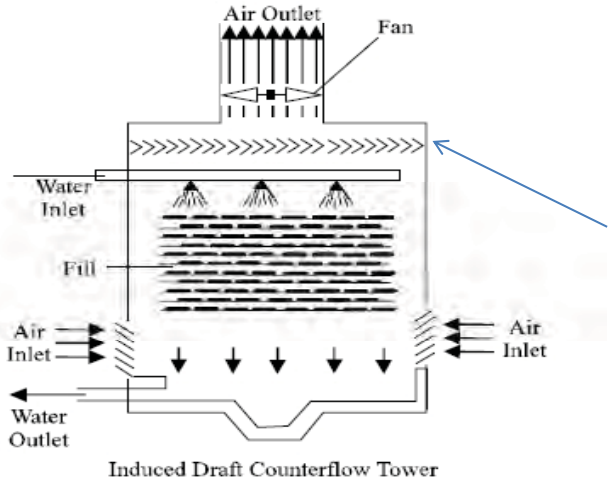
FPL employs a balanced and inclusive approach to obtain input from agencies, local governments, and customers

Project Update

- **Since ’08** Over 100 meetings with members of the public, local governments, and agencies
- **Jun ‘09** State (SCA) and Federal (COLA) applications were submitted
- **Oct ‘09** Florida Public Service Commission authorized project through 2010 (annual process)
- **Apr ‘10** Miami-Dade County (MDC) approved a CDMP amendment for Access Roads
- **May ‘10** Air Emissions (PSD) and Exploratory well (UIC) permits were issued
- **July ’10** MDC approved Joint Participation Agreement for reclaimed water

Aerosol drift is a very small component of the water used

Turkey Point Units 6 & 7: Cooling Tower Drift



Induced Draft Counterflow Tower

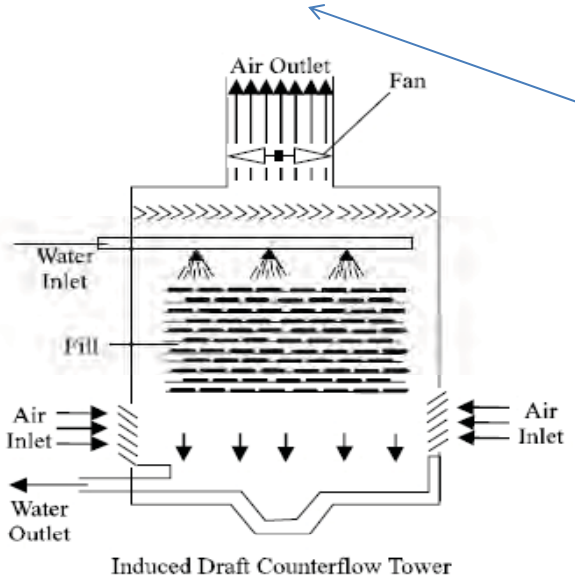
- **Less than 0.01 MGD (0.0005%) of all the water circulated through the cooling towers is aerosol drift.**
- **Aerosol is controlled by high efficiency drift/mist eliminators, air pollution control technology determined by FDEP to be Best Available Control Technology.**

Reclaimed supply:	**55.6**
Evaporation:	**41.5**
Disposal:	**14 blowdown**
	(18 Total)

(Units- million gallons per day)

Aerosol drift is highly diluted in cooling tower exhaust

Turkey Point Units 6 & 7: Cooling Tower Deposition



Induced Draft Counterflow Tower

- For each pound of aerosol drift there is about 164,000 pounds of air.
- Maximum impact is reduced by 390 times due to dispersion.
- Deposition decreases greatly with distance from towers.

No adverse impacts to the environment is predicted from cooling tower drift

Turkey Point Units 6 & 7: Cooling Tower Deposition

The maximum deposition occurs within the FPL site and the industrial wastewater treatment facility.

The aerosol drift outside FPL property is lower than natural background deposition that occurs in south Florida.

Percent of Maximum Deposition

Red-	67.45%
Yellow-	39.23%
Green-	17.66%
Blue-	6.29%
Gray-	3.16%

Turkey Point Units 6 & 7: Cooling Tower Deposition

Percent of Maximum Deposition

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The predicted salt deposition impact in the Biscayne Aquatic Preserve is 10,000 times less than the natural conditions.

The estimated salt deposition impact in the freshwater wetland is 100 times less than the natural conditions.

RCW SALINITY IMPACT ANALYSIS

- **Previous analyses in the SCA process used data from the following stations:**
  - – BB41 located about 3.2 miles NE of Turkey Point peninsula,
  - – BISC101 located about 2.8 miles North of Turkey Point peninsula, and
  - – BISC122 located about 1 mile South of Turkey Point peninsula.
- **Jeremy Stalker's work supports FPL's analysis that the salinity at Station BB41 is representative of the salinity at the Turkey Point peninsula**
- **Update to Salinity Impact Analysis:**
  - – Data was provided by Biscayne National Park for Site 12,
  - – Data is from a station located on the bottom, and
  - – Station is located about 1 mile east of Turkey Point peninsula

Analysis shows the fresh water content at both locations is very small and there is no significant difference between stations

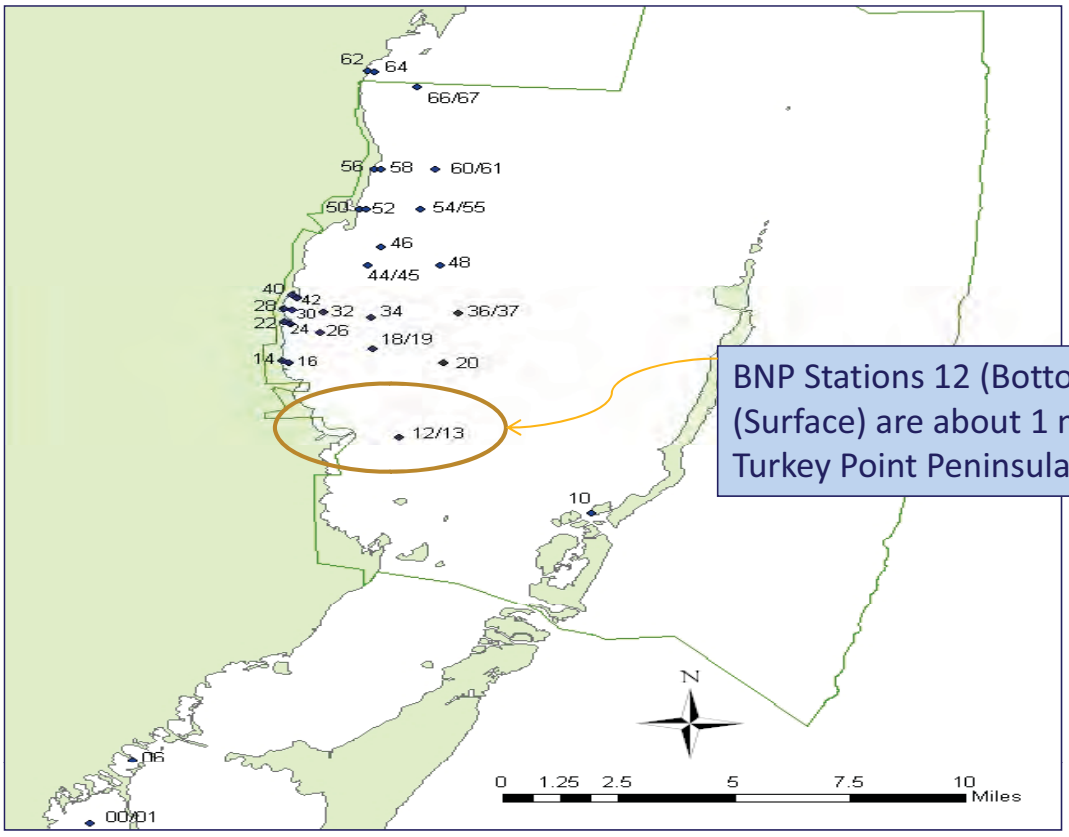
Comparison of Station BB41 and Turkey Point peninsula

	Station BB41	Turkey Point peninsula
Mean Annual Salinity (PSU)	33.7	33.8
Total Fresh Water Content (%)	5.34	5.03
Fresh Water Sources:	est. accuracy +/- 5 %	
Canal Water (%)	46	45
Precipitation (%)	48	44
Groundwater (%)	6	11

Source: Golder 2010
Data Source: Stalker, 2008

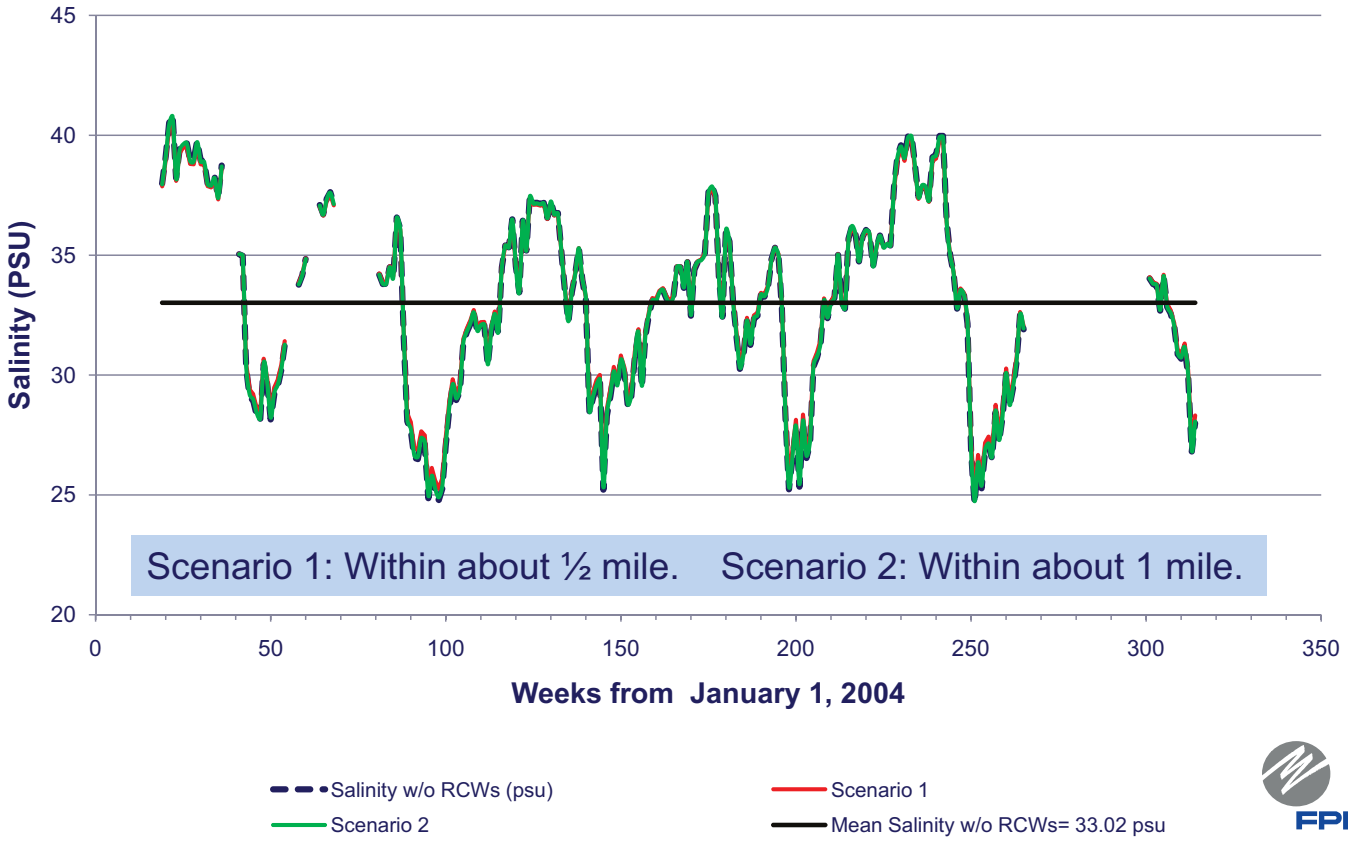
Another analysis was performed using BNP Station 12 data

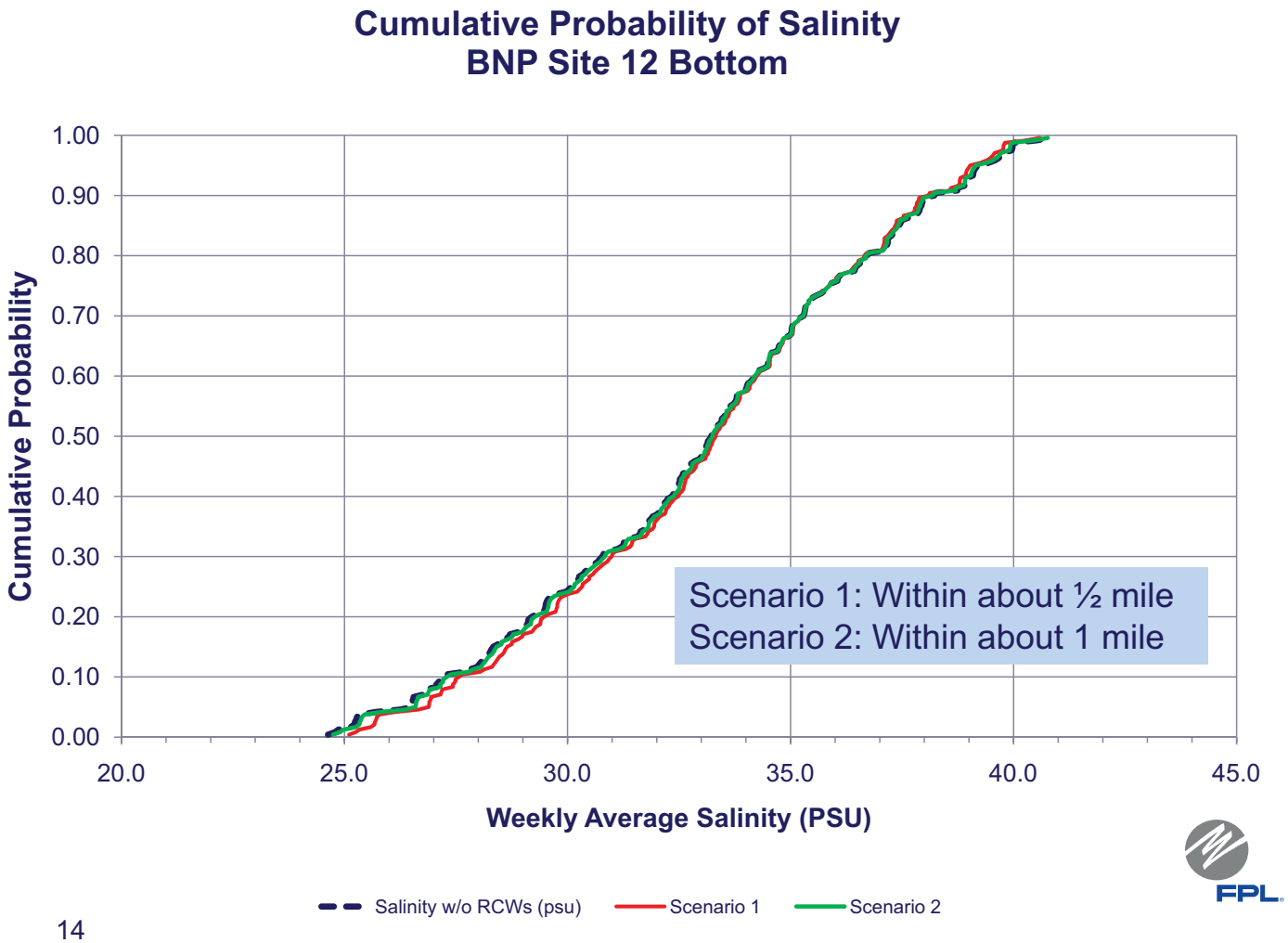
STATIONS 12/13 LOCATON



BNP Stations 12 (Bottom) and 13 (Surface) are about 1 mile east of the Turkey Point Peninsula

Time History Plot
BNP Site 12 Bottom
Weekly Average Salinity, 2004-2009




Cumulative Probability of Salinity
BNP Site 12 Bottom
Cumulative Probability
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
20.0
25.0
30.0
35.0
40.0
45.0
Weekly Average Salinity (PSU)
Scenario 1: Within about ½ mile
Scenario 2: Within about 1 mile
Salinity w/o RCWs (psu)
Scenario 1
Scenario 2

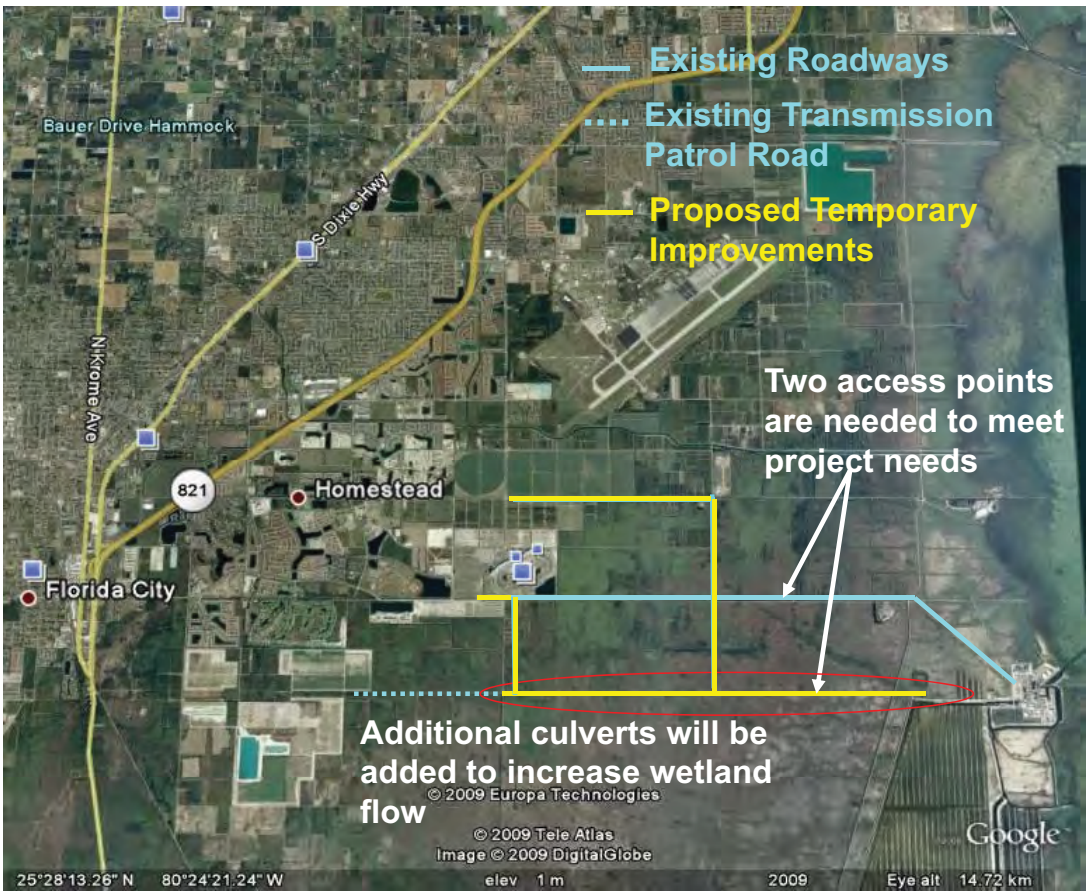
The absolute and relative differences are a small fraction of the range of natural salinity changes

	BNP Site 12 (Bottom) Salinity Impact				
		With RCWs			
		Scenario 1 **Within About 1/2 Mile**		**Scenario 2** **Within About 1 Mile**	
	Without RCWs	**Value**	**% Change**	**Value**	**% Change**
Maximum Salinity	**40.83**	**40.59**	**-0.6%**	**40.77**	**-0.1%**
Mean Salinity	**33.02**	**33.12**	**0.3%**	**33.04**	**0.1%**
Median Salinity	**33.23**	**33.33**	**0.3%**	**33.25**	**0.1%**
Minimum Salinity	**24.63**	**25.10**	**1.9%**	**24.75**	**0.5%**

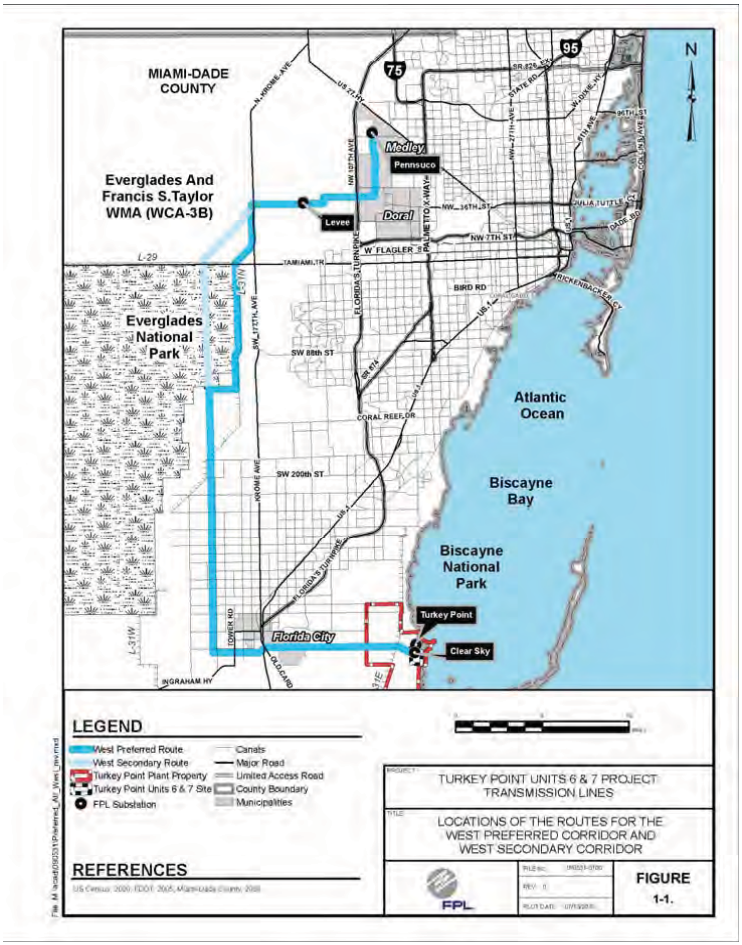
Conclusions of RCW Salinity Impact Analyses

- Changes to the mean and median salinity values in Biscayne Bay will be very small,
- Extreme salinity values will be moderated,
- The changes are calculable, but are not likely measurable, and
- No adverse impacts to Biscayne Bay salinity is predicted from operation of the RCWs.

Temporary Roadway improvements required to safely and economically allow for Unit 6 & 7 construction traffic and existing units operational traffic to access the site



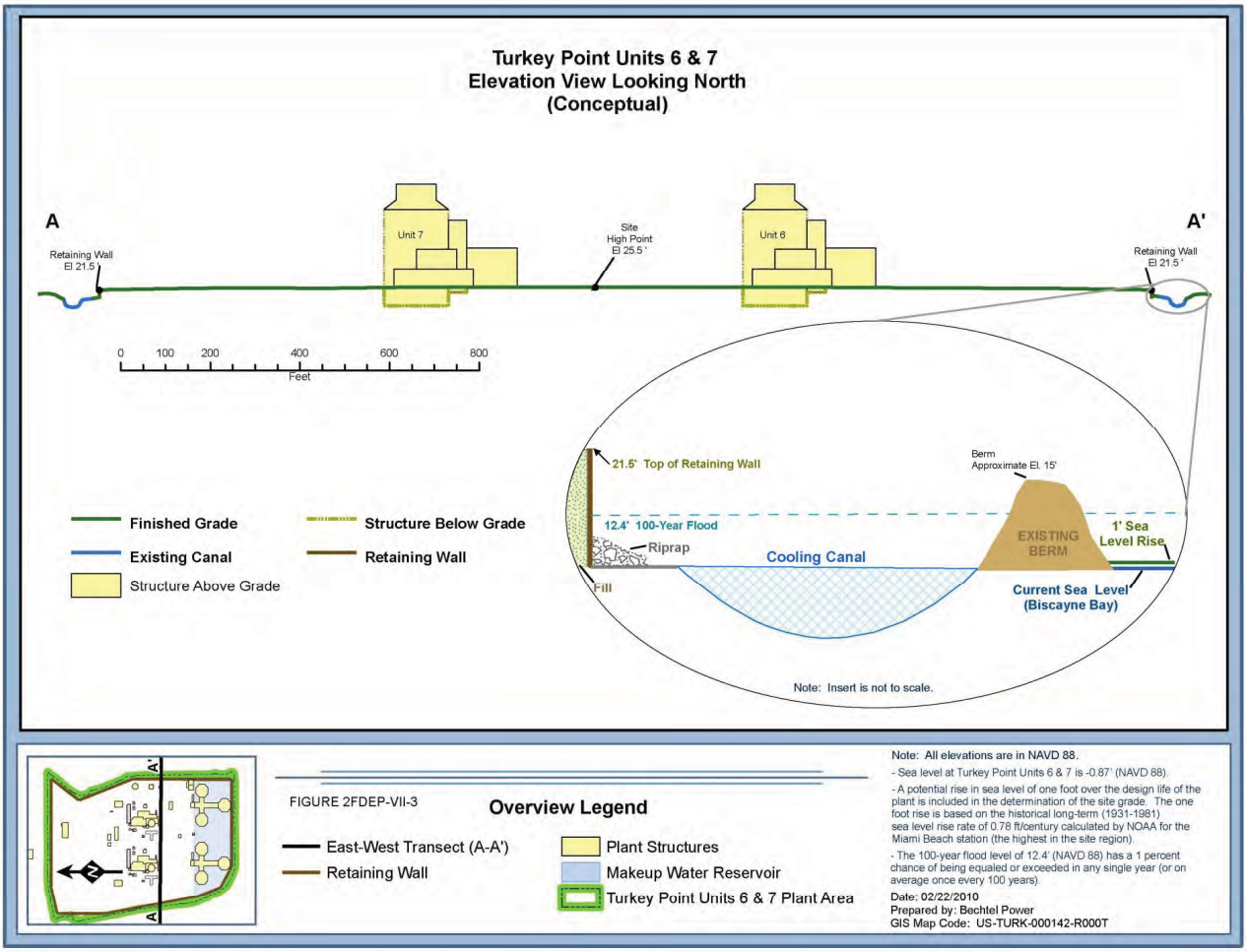
West Corridors and ENP ROW Exchange



- A preferred and a secondary western corridor are proposed in the SCA and are currently under review
- The preferred corridor is the location of the proposed land swap area that relocates the FPL ROW from within ENP with no acquisition costs
- NPS is currently conducting an environmental assessment for the proposed land exchange
- The secondary corridor is the existing FPL fee owned ROW

Sea Level Rise

- **The design floor elevation at Turkey Point Units 6 & 7 based on the storm surge and coincidental wave run-up during the Probable Maximum Hurricane (PMH) event**
- **Sea level rise based on the historic NOAA determined rise of 0.78 feet/100 years for the Miami area against the North American Vertical Datum of 1988 (NAVD 88)**
- **FPL used 1 foot of rise by 2080 (60 year design life for Unit 7) - 113% more than the historic value**
- **Plant design floor elevation of 26 feet**
  - Result of these analyses
  - Accommodates the maximum expected events that have a probability of occurrence of once in a million years
- **If Units 6 & 7 are intended for use beyond 2060, license renewals will be required involving thorough review by NRC**


Turkey Point Units 6 & 7
Elevation View Looking North
(Conceptual)
A
A'
Retaining Wall
El 21.5 '
Unit 7
Site
High Point
El 25.5 '
Unit 6
Retaining Wall
El 21.5 '
0
100
200
400
600
800
Feet
Finished Grade
Existing Canal
Structure Above Grade
Structure Below Grade
Retaining Wall
21.5' Top of Retaining Wall
Berm
Approximate El. 15'
12.4' 100-Year Flood
Riprap
Cooling Canal
EXISTING
BERM
1' Sea
Level Rise
Fill
Current Sea Level
(Biscayne Bay)
Note: Insert is not to scale.
FIGURE 2FDEP-VII-3
Overview Legend
East-West Transect (A-A')
Retaining Wall
Plant Structures
Makeup Water Reservoir
Turkey Point Units 6 & 7 Plant Area
Note: All elevations are in NAVD 88.
- Sea level at Turkey Point Units 6 & 7 is -0.87' (NAVD 88).
- A potential rise in sea level of one foot over the design life of the plant is included in the determination of the site grade. The one foot rise is based on the historical long-term (1931-1981) sea level rise rate of 0.78 ft/century calculated by NOAA for the Miami Beach station (the highest in the site region).
- The 100-year flood level of 12.4' (NAVD 88) has a 1 percent chance of being equaled or exceeded in any single year (or on average once every 100 years).
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Prepared by: Bechtel Power
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Questions?