



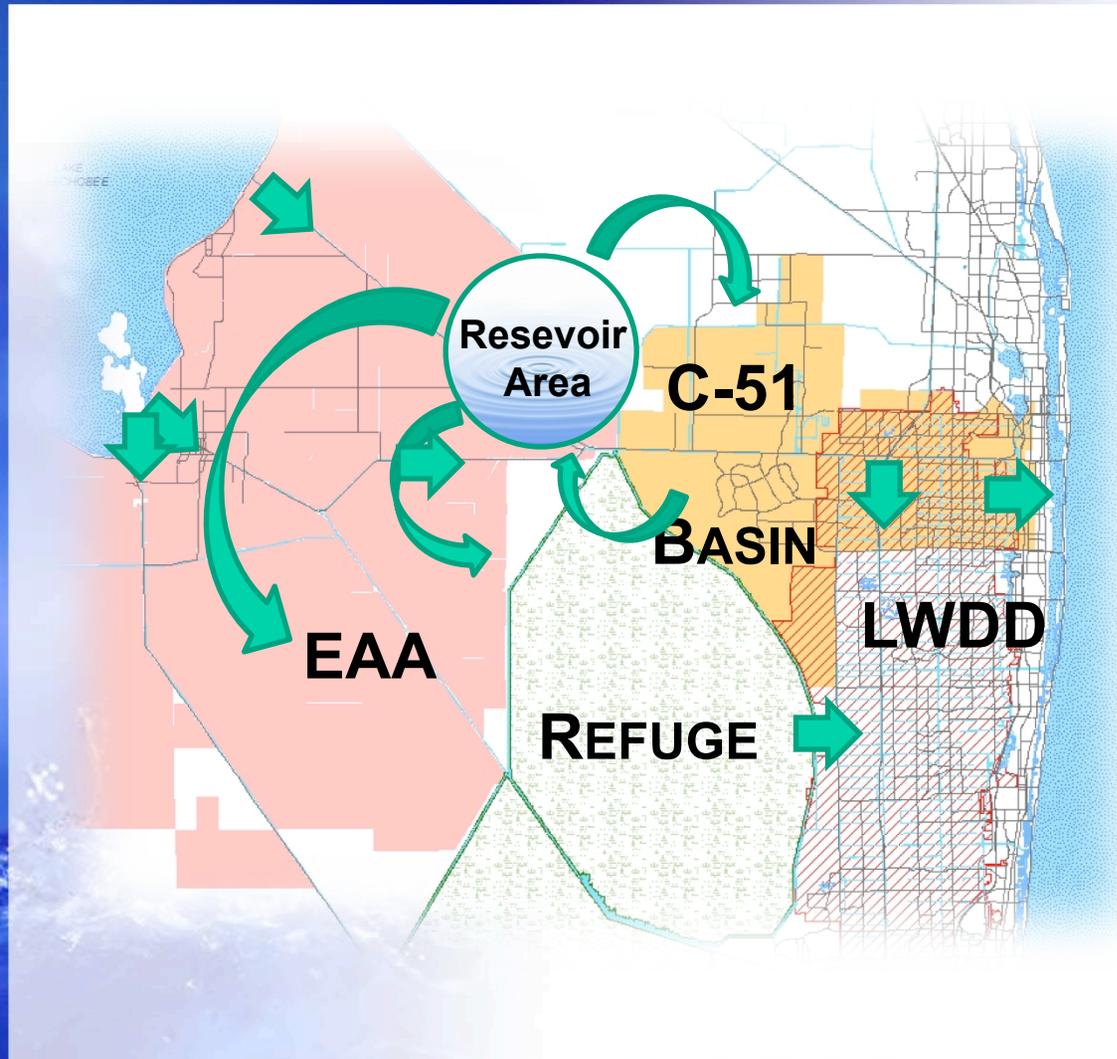
C-51 Reservoir Phase 2A Update

Broward County Water Resources Task Force

Friday, November 6, 2009

Presenter: Albert Carbon, P.E.
 Public Works Director
 City of Fort Lauderdale

Original Feasibility Study Concept



- Environmental restoration
- Water Supply for LEC utilities
- Water management flexibility

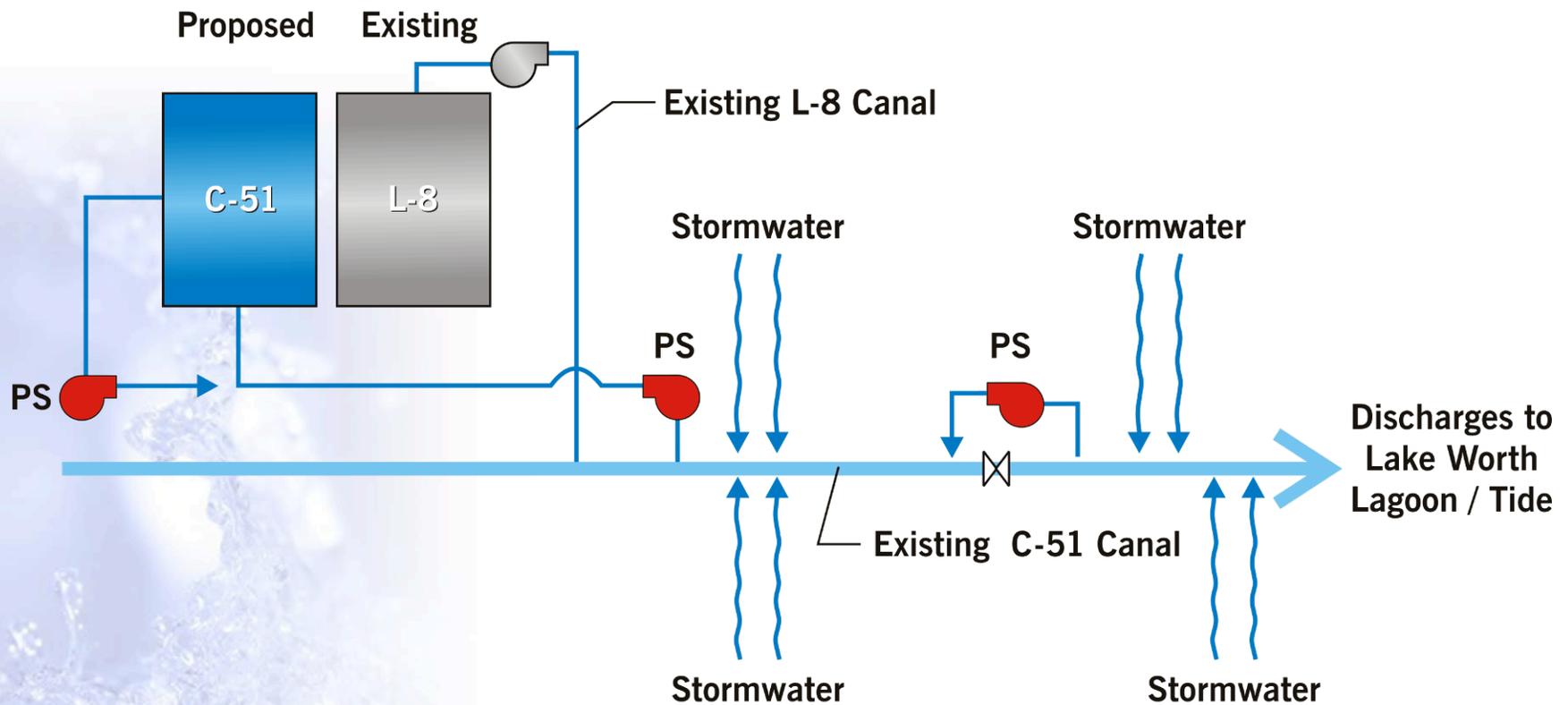
C-51 Reservoir reduces storm water flows to estuaries



C-51 Reservoir reduces storm water flows to estuaries



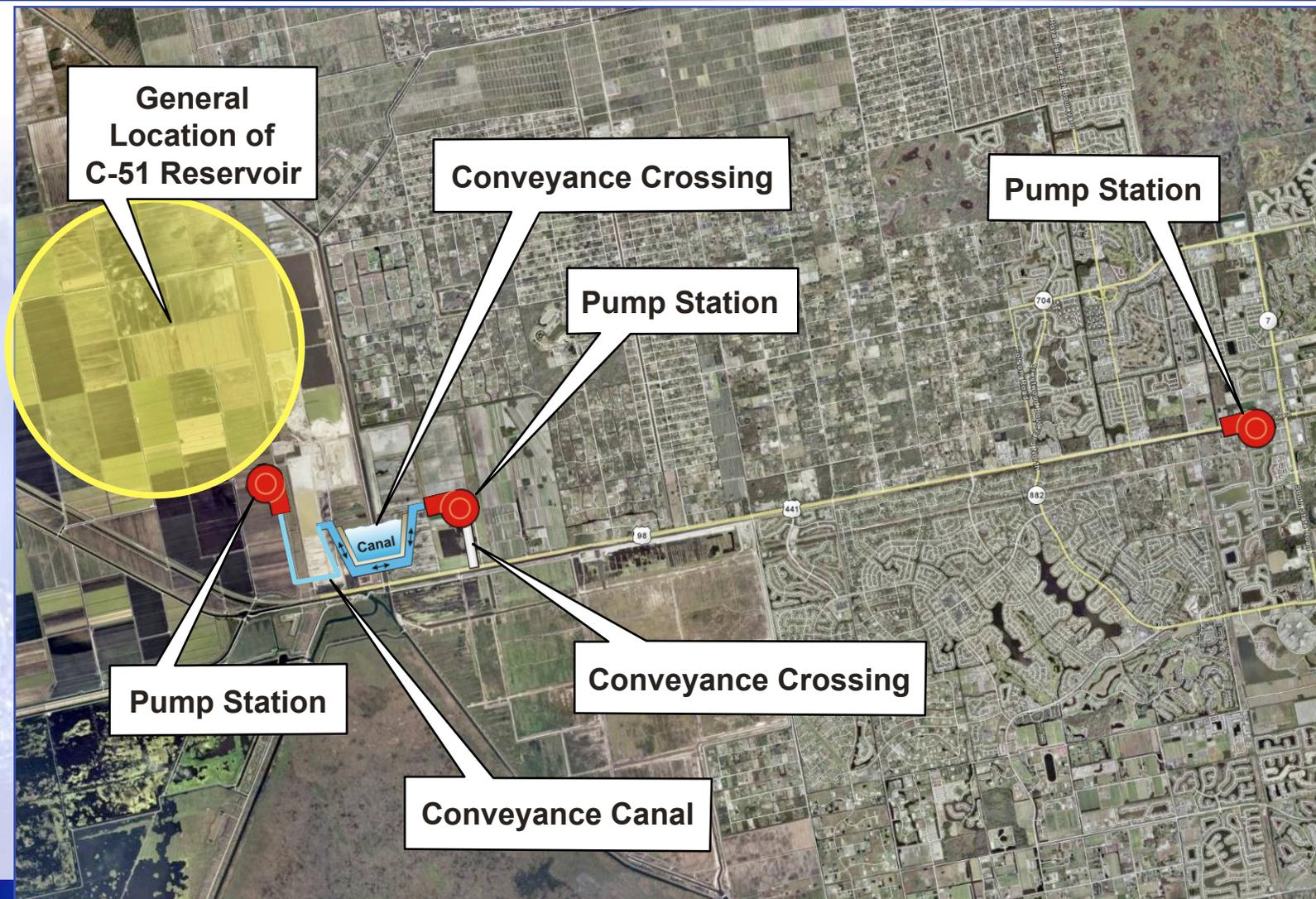
C-51 Reservoir captures storm water for LEC utilities' water supply



43000-036

Major Facilities

General facilities layout



Phase 2A Scope of Work

Task 1 – Update Raw Water Demand Projections

Task 2 – Evaluate Two Water Conveyance Alternatives –
LWDD and EAA

Task 3 – Compare L-8 Reservoir Geotechnical and
Hydrologic Conditions to possible C-51
Reservoir location

Task 4 – C-51 Reservoir Cost-Effectiveness
Sensitivity Analysis

Task 1 – Unmet demand projections (annual average, mgd)

Item	Southern Palm Beach County	Broward County	Total
2030 Updated Lower Bound Estimate	59	60	120
2030 Updated Upper Bound Estimate	76	87	163
2025 Original Estimate	105	143	248

1. Lower bound estimate assumes planned withdrawals from Floridan aquifer take place
2. Upper bound estimate assumes planned withdrawals from Floridan aquifer do not take place and, instead, water is withdrawn from Biscayne aquifer

Estimated water needed and available from C-51 Reservoir in annual average mgd

Item	2030
Amount of Water Needed from C-51 Reservoir in MGD	
Broward County	45 to 66
Southern Palm Beach County	52 to 65
Florida Power & Light	25
Total Water Needed	97 to 131
Amount of Water Available from C-51 Reservoir	120
Water Demand as % of Water Available from C-51 Reservoir	81% to 109%

Task 2a – Reservoir can meet intent of LEC Regional Water Availability Rule

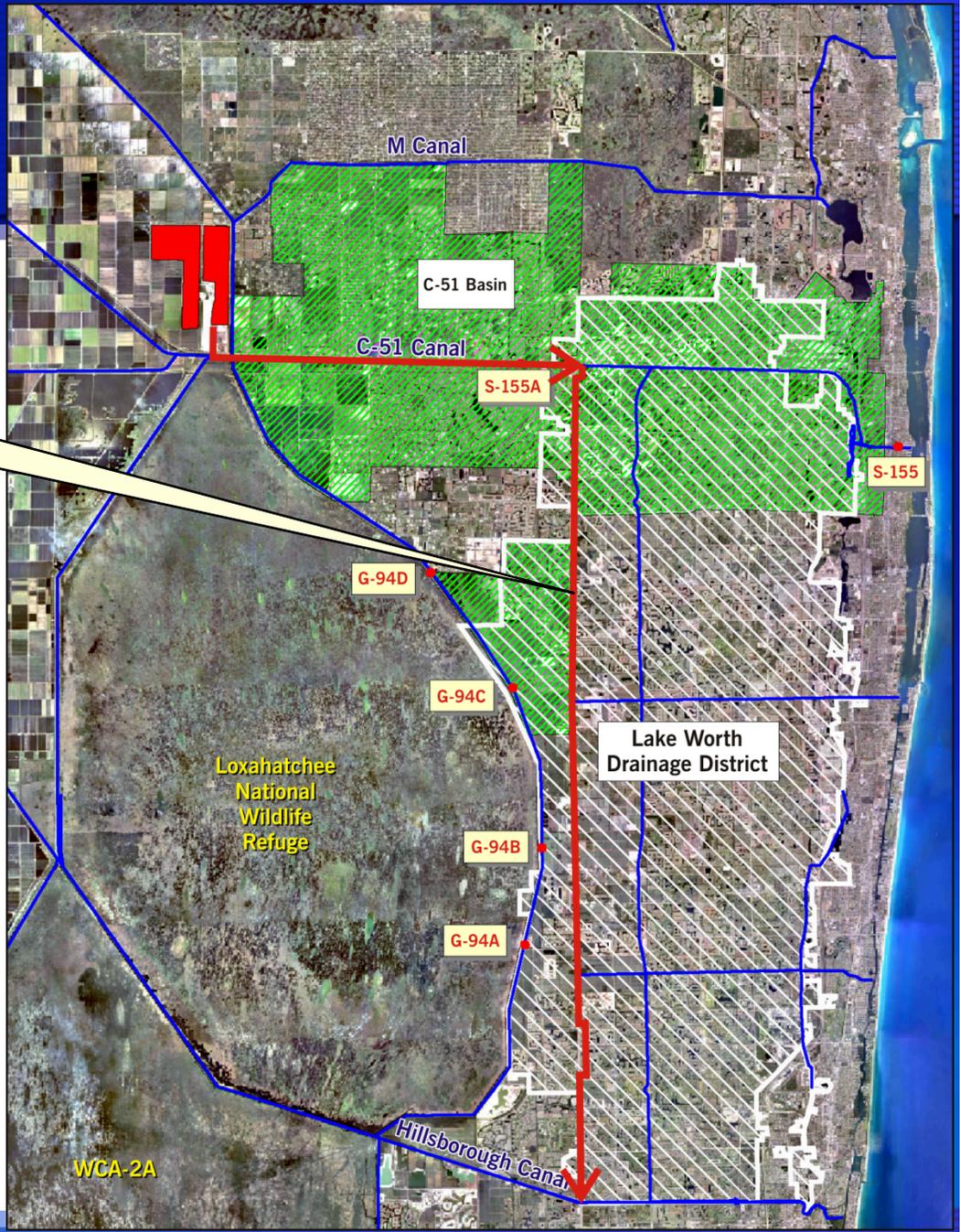
- It can be considered an alternative water supply project and/or a water resource development project
- It captures storm water and offsets additional demands
- It does not increase the volume or change the timing of withdrawals from the Waterbodies over the base condition water use

Task 2a – Multiple pathways for Rule Compliance via certification

- The Reservoir can satisfy methods for Rule compliance:
 - (1) Certification Process
 - (2) Offsets
 - (3) Alternative Water Supply
 - (4) Available Wet Season Water
- As a resource development project, SFWMD Governing Board authorizes offsets to allow both counties to use reservoir as future alternative water supply
- As a water supply project, District reviews an application for an alternative water supply reservoir to provide offsets for additional withdrawals from the surficial aquifer

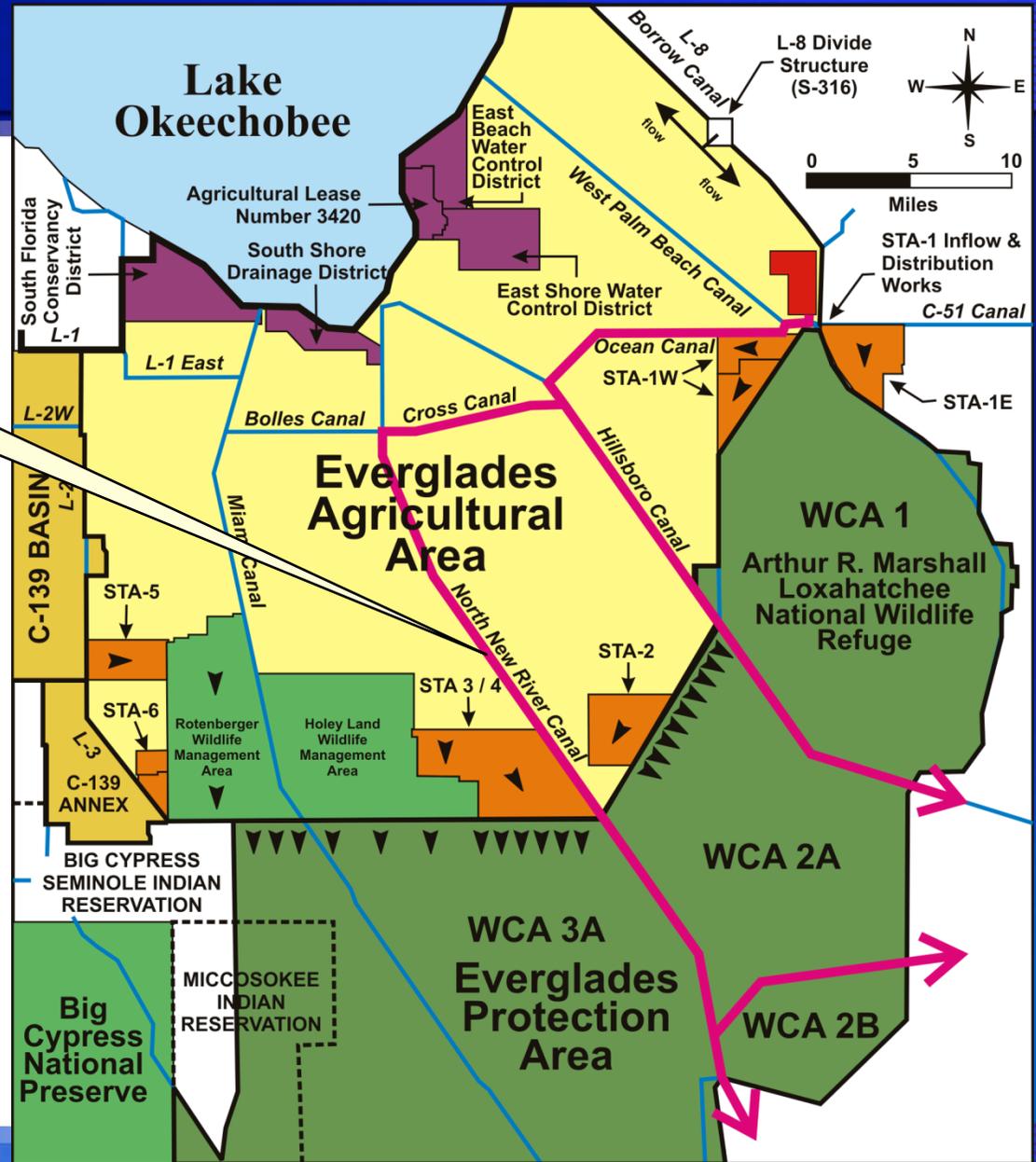
Task 2b – Lake Worth Drainage District

Conveyance Alternative 1



Task 2b – Everglades Agricultural Area

Conveyance Alternative 2



Task 2b – Both conveyance alternatives can deliver water from reservoir to LEC wellfields

- Conveyance Alternative No. 1 – LWDD:
 - Additional capital cost (est) = \$50 million
 - Annual O&M cost = \$186,300
- Conveyance Alternative No. 2 – EAA:
 - Additional capital cost (est) = \$0 million
 - Annual O&M cost = \$200,000
- If reservoir water is to be transported through the EAA, then a detailed analysis is needed that addresses water quantity and water quality issues
- Further analysis is particularly important to identify the potential impacts and benefits to Everglades restoration

Task 3 – Hydro-geology directly west of L-8 Reservoir may be favorable for storing water

- Conclusion based on examining available data from District and from Palm Beach Aggregates' engineering consultants
- Geologic and hydrologic characteristics in area west of and adjacent to the existing L-8 Reservoir are similar to those of the L-8 Reservoir
- Aquifer performance properties show a higher transmissivity in west area but still significantly lower than typical EAA conditions

Task 3 – Hydro-geology directly west of L-8 Reservoir may be favorable for storing water

- Overall, west area likely to have highly favorable hydro-geologic characteristics:
 - Isolate stored water within the reservoir
 - Allow for very little seepage from outside the reservoir
- Final design of any new feature to the west of the L-8 Reservoir will require:
 - Further data collection
 - Site and performance analysis

Task 4 – Cost Effectiveness Analysis – Preliminary C-51 Reservoir Project Conceptual Design Costs

Project Component		Original Study	Conveyance Alternative	
			1 – LWDD	2 – EAA
(1)	C-51 Reservoir Construction and Property	\$274	\$308.5	\$308.5
(2)	S155A Pump Station	\$9	\$9.4	\$9.4
(3)	Southern Boulevard Conveyance Crossing	\$6	\$6.2	\$6.2
(4)	S5AE Pump Station	\$11	\$11.4	\$11.4
(5)	L-8 Canal Conveyance Crossing	\$5	\$5.2	\$5.2
(6)	C-51 Reservoir Conveyance Canal and Inflow Structure	\$6	\$6.2	\$6.2
(7)	C-51 Reservoir Water Supply Pump Station	\$42	\$43.7	\$43.7
(8)	298 District Improvements	\$10	\$10.4	\$10.4
(9)	LWDD Improvements	\$0	\$50.0	\$0.0
Total		\$363	\$451.1	\$401.1

(a) Capital cost in millions of dollars

Task 4 – Estimated Unit Costs of Proposed C-51 Reservoir (preliminary)

Type of Cost	Capital Cost In Dollars Per Gallon of Capacity		
	Original	Alternative 1: LWDD	Alternative 2: EAA
Cost per Water Offset (120 mgd)	\$3.03	\$3.76	\$3.34
Cost per Raw Water Provided (160 mgd)	\$2.27	\$2.82	\$2.51
Cost per Potable Water Produced (136 mgd) (a)	\$2.67	\$3.32	\$2.95

(a) Does not include the cost of water treatment and distribution

Questions