

APPENDIX I

**CENTRAL EVERGLADES PLANNING PROCESS
ISSUE RESOLUTION**

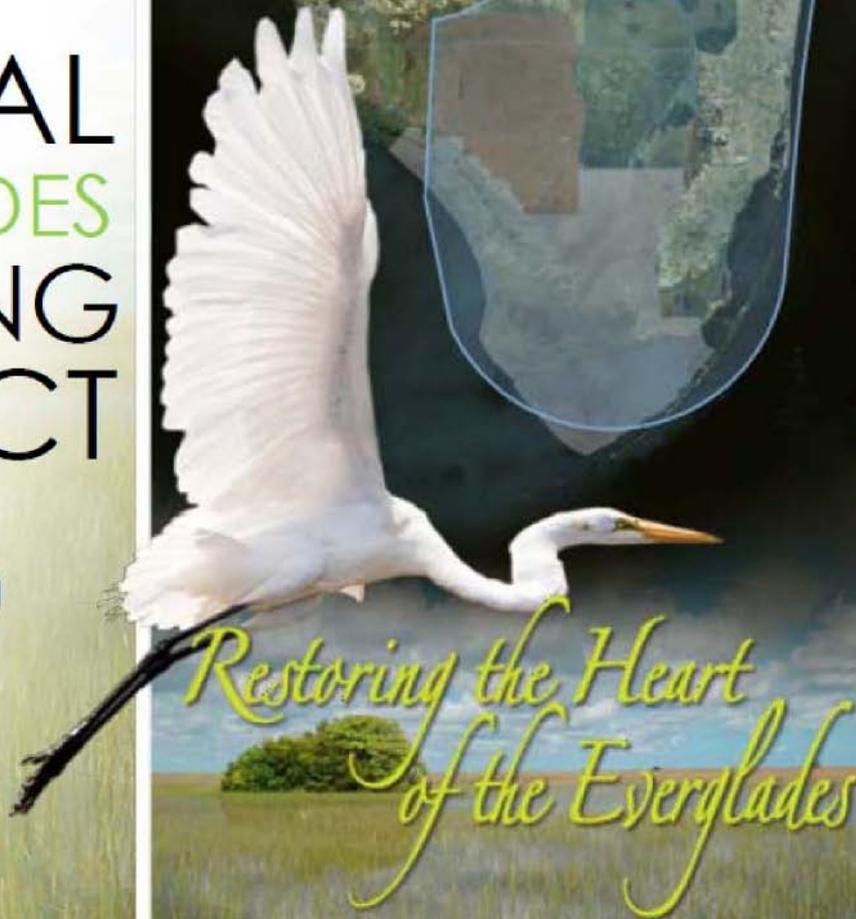
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Central Everglades Planning Project

EAA
Formulation
Issue
Resolution
Conference

July 20, 2012

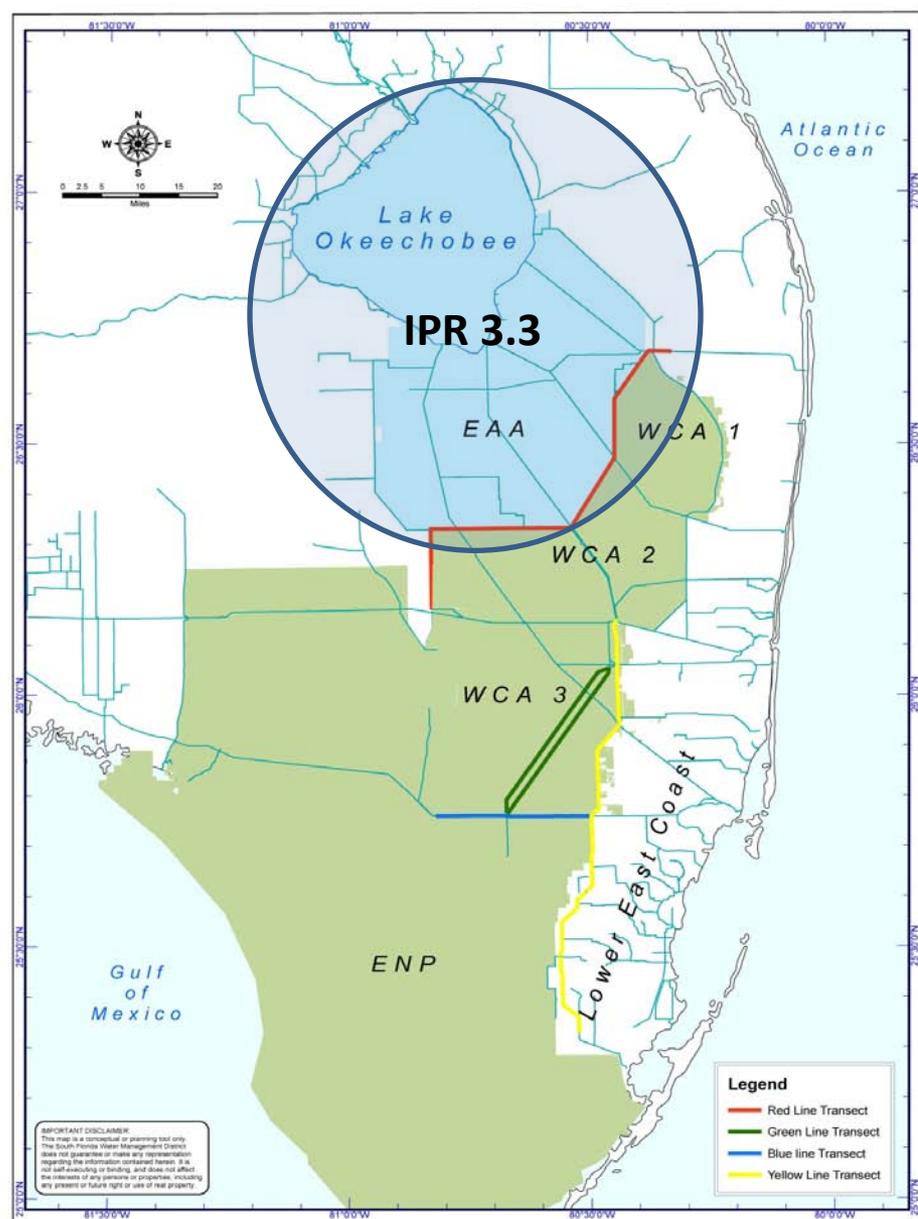
CENTRAL EVERGLADES PLANNING PROJECT



MEETING PURPOSE

- **Issue Resolution Conference (IRC)**
 - Policy decision and direction on integrating use of State Restoration Strategies facilities for delivering additional water to Everglades:
 - Decision: Approval of formulation approach for EAA features or re-formulation of EAA features required
 - Concurrence on screening results
 - Decision: Dependant or Independent required for EAA features

Formulation With a Spatial Perspective



REDLINE –Everglades Agricultural Area (EAA) and the WCA 3A (L-4, L-5 and L-6 levees and canals)

GREENLINE – WCA 3A and WCA 3B (L-67A and C levees and associated canals)

BLUELINE - WCA 3A/3B and Everglades National Park (ENP) (Tamiami Trail roadway and L-29)

YELLOWLINE –WCA 3A/3B and ENP to the lower east coast (east coast protective levee system, the L-30 and L-31N)

STATUS: REDLINE Screening

- IPR 3.3, May 30, 2012 – Briefed SCREENING analysis of options north of the redline
 - Results of screening indicate an integrated FEB on A-1/A-2 is the least-cost
- June 2012 - State Restoration Strategies Plan announced
 - Deep storage options on A-1 parcel no longer compatible with State Remedies Plan
- IPR 3.4, June 7, 2012 – Discussed concerns raised on formulation approach and definition of complimentary
- Additional analyses conducted to consider options that are “independent” of State Remedies facilities

What is the State's compliance requirement?

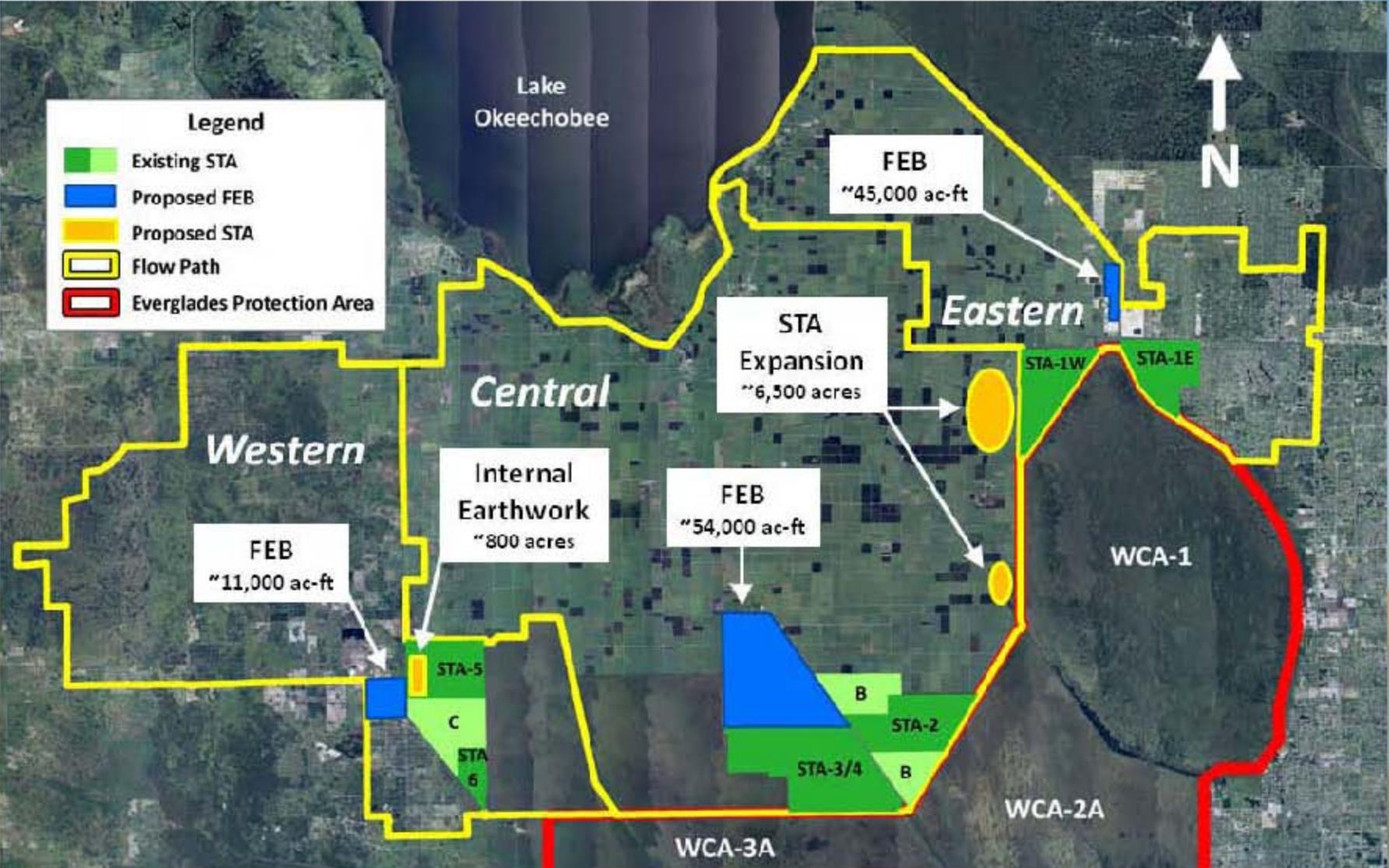
Restoration Strategies
Regional Water Quality
Preliminary Plan



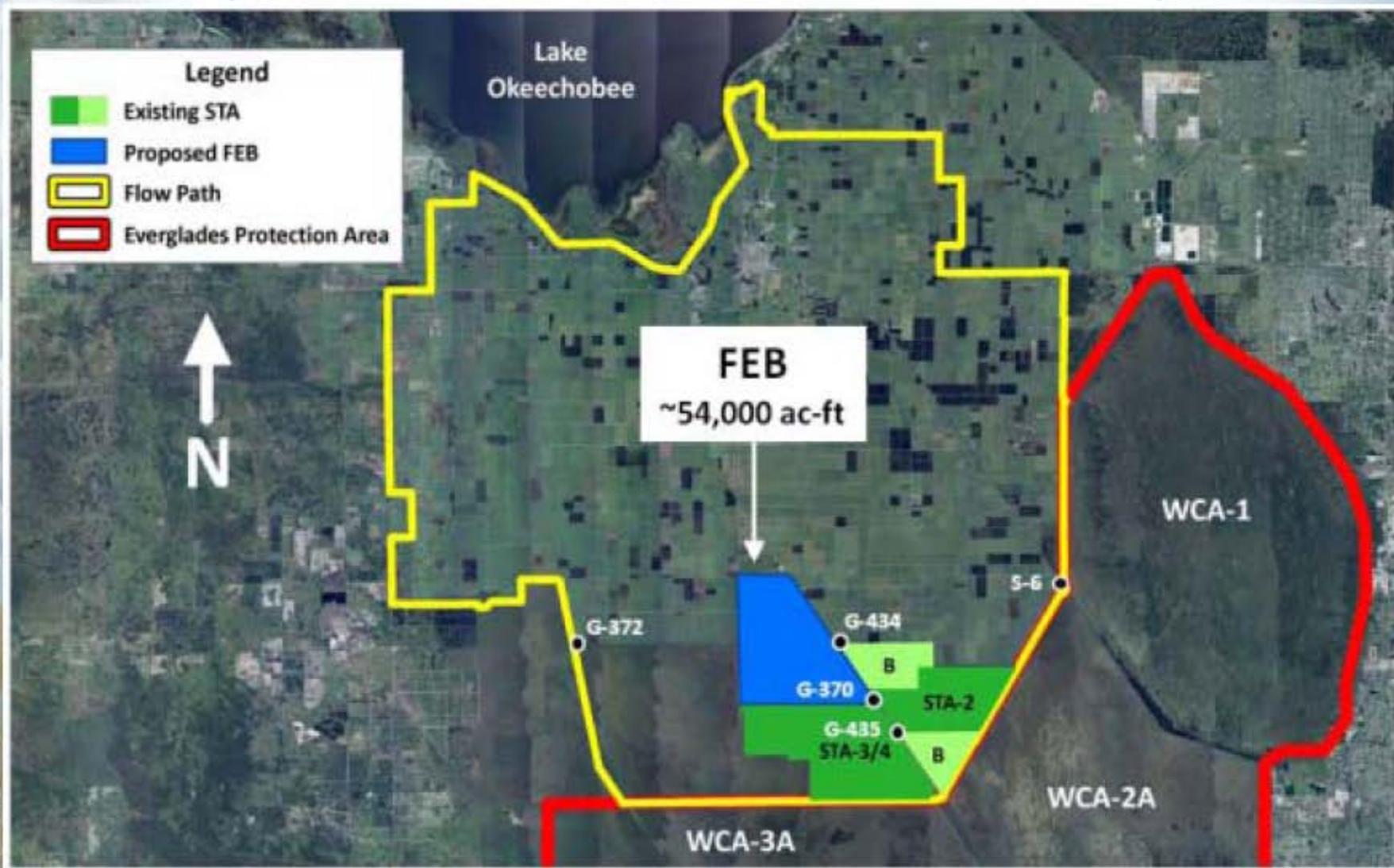
Prepared by
South Florida Water Management District

April 27, 2012

Treat an average of 1.5 Million ac-ft/yr of **existing** run-off from contributing basins



CENTRAL FLOWPATH treat an average of 877,300 ac-ft/yr **existing** runoff



Average Annual Flows and Total P Loads and Concentrations for Central Flowpath

Source Basin	Flow (ac-ft per year)	Total Phosphorus Load (metric tons per year)	Total Phosphorus Concentration (ppb)
S-5A	59,800	15.7	213
S-6	181,400	24.8	111
S-7	263,900	31.9	98
S-8	218,400	22.5	83
ESWCD & 715 Farms	22,700	3.7	132
SFCD	19,100	2.5	108
SSDD	11,700	1.7	116
C-139 (via G136)	14,700	2.8	154
Lake Okeechobee (Regulatory Releases)	58,300	10.4	145
Lake Okeechobee (Urban Water Supply via S351 and S354)	27,300	4.6	138
Total	877,300	120.6	111

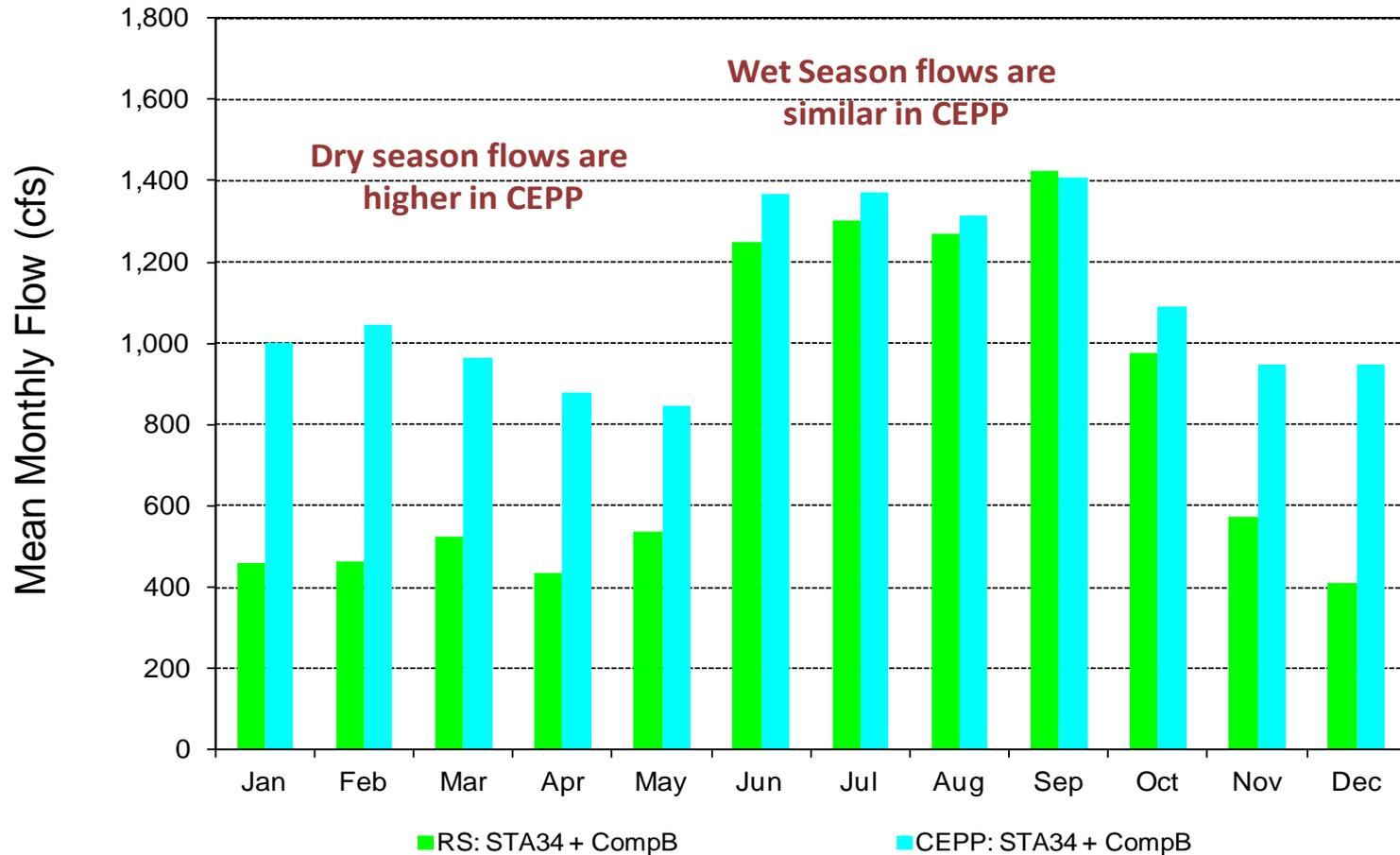
CEPP Formulation and State Restoration Strategies

- CEPP Project Objectives are to capture water currently being discharged to northern estuaries and re-direct south to benefit the Everglades
- Most efficient means to do this is through the existing C&SF infrastructure in the Central Flowpath (i.e. Miami and/or North New River Canal)
- Therefore, CEPP formulation has been focused in the Central Flowpath and is not proposing any modification or operational changes to the inflows to State features in Eastern or Western flowpaths

PERTINENT INFORMATION

- State Remedies facilities were designed to handle peak runoff and meet water quality standards
- State Remedies facilities not operating continually at peak rate, therefore capacity existing in off-peak times
- CEPP formulation considered using excess capacity of State facilities during off-peak time

Average Monthly Flow Distribution



Notes: Both scenarios meet applicable phosphorous water quality standards.
On average, CEPP delivers ~ 200 kac-ft additional flow to the Everglades.

RESULTS OF SCREENING (OPTIONS MODELED)

- Screening effort resulted in 2 cost-effective measures with wide differences in costs
 - The 28K acre FEB (A-1 and A-2) is the least cost option
 - The 21K acre 12ft Reservoir with 7K acre STA provides the greatest benefits to the everglades; however, the cost is prohibitive and the 12ft Reservoir configurations were eliminated from further consideration

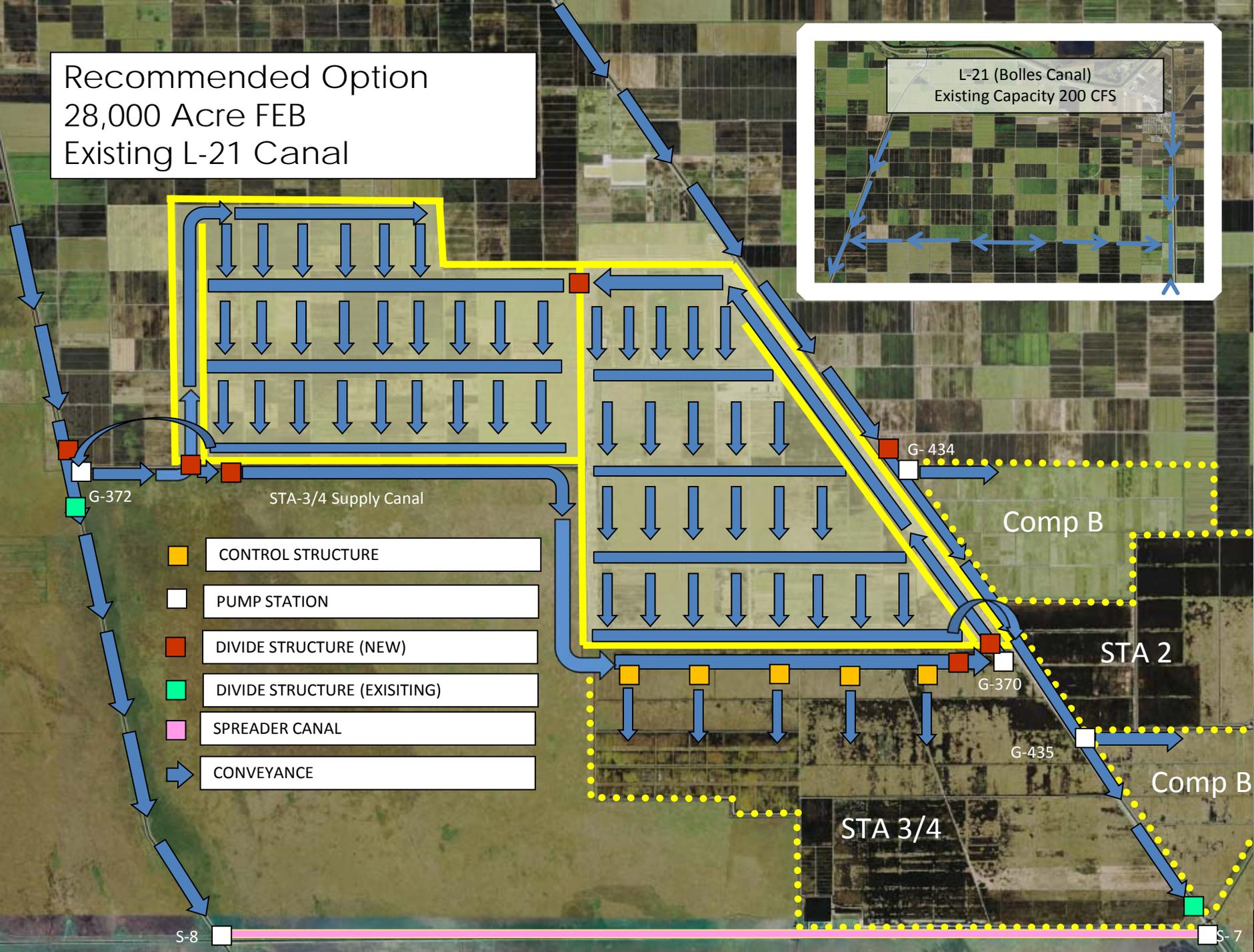
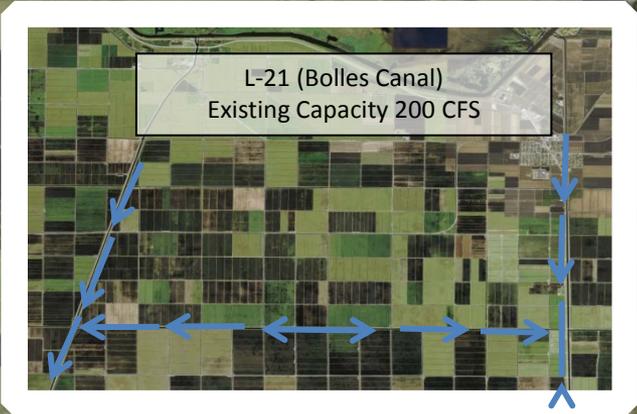
28,000 acre FEB delivers ~ 200,000 kac-ft/yr additional flow to the Everglades at cost of:

\$175M Construction O&M of FEB on A-2 only

\$ 40M real estate for A-2

\$215M total (cost-shared)

Recommended Option
 28,000 Acre FEB
 Existing L-21 Canal



- CONTROL STRUCTURE
- PUMP STATION
- DIVIDE STRUCTURE (NEW)
- DIVIDE STRUCTURE (EXISTING)
- SPREADER CANAL
- CONVEYANCE

S-8

S-7

G-372

STA-3/4 Supply Canal

G-434

Comp B

STA 2

G-370

G-435

Comp B

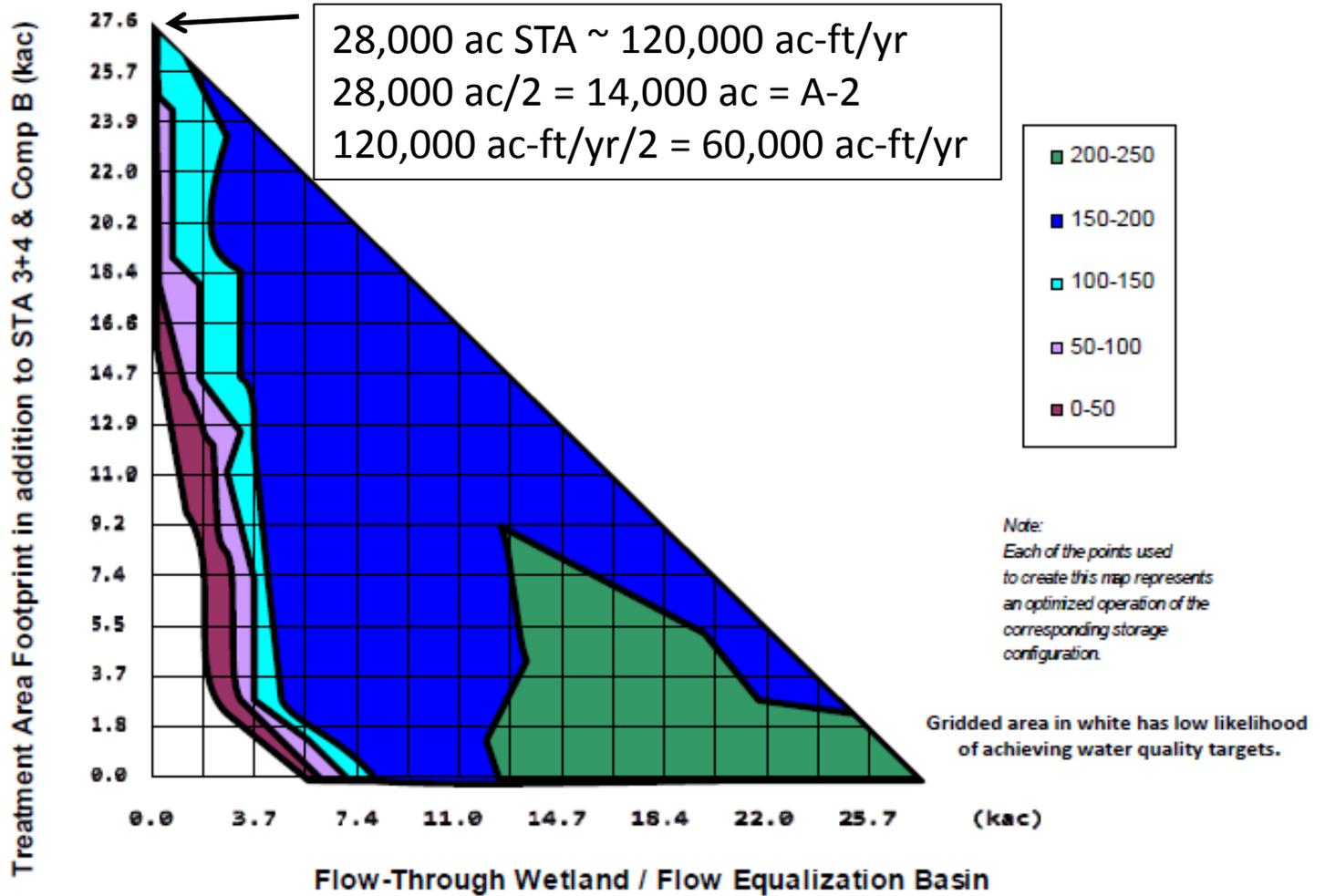
STA 3/4

Additional Analysis

options which operate
independently from State
Remedies

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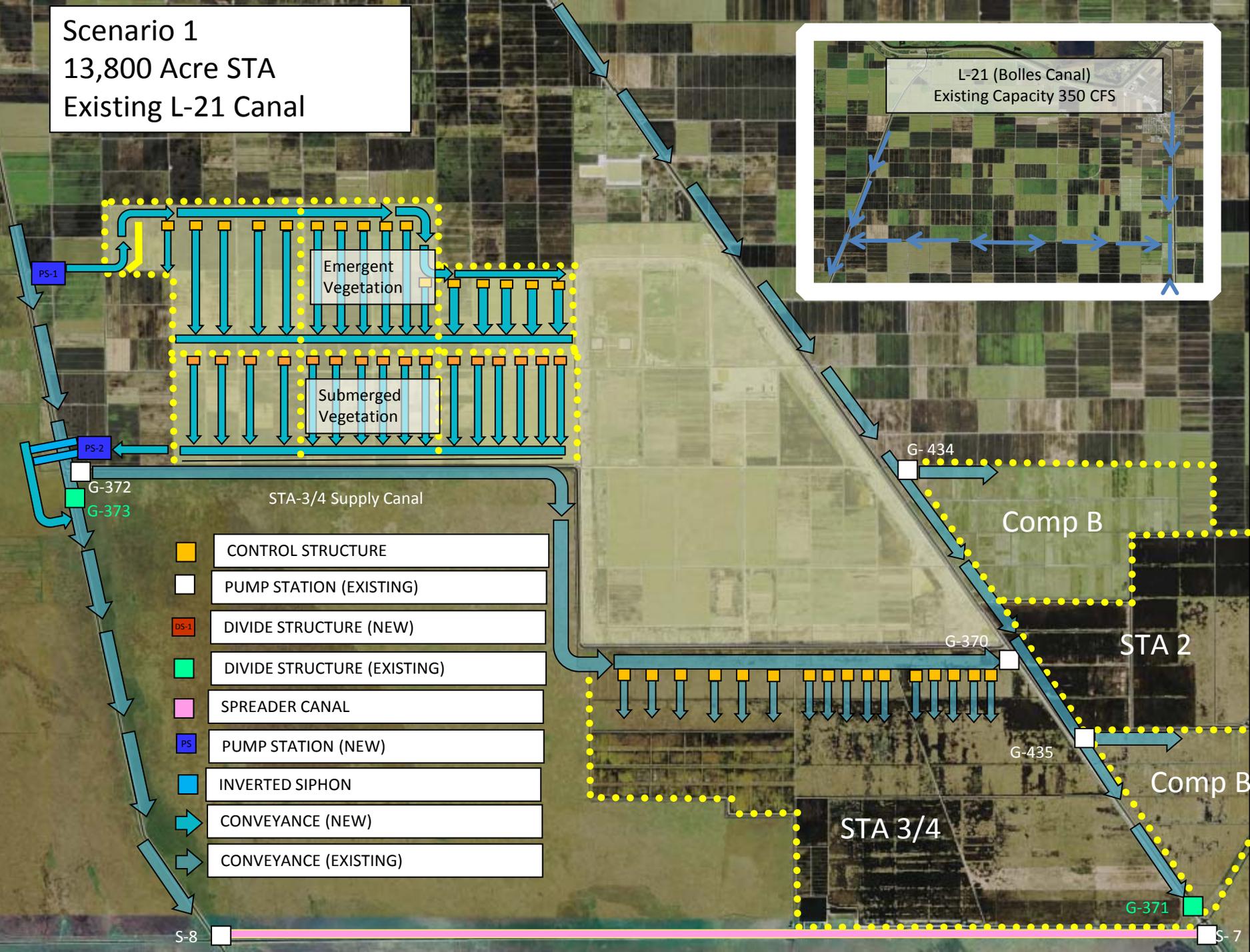
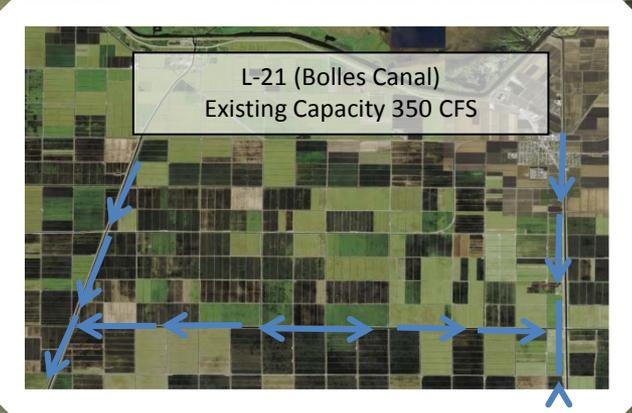
Additional Average Annual Flow to Everglades (kac-ft)



SCENARIO 1: Independent facility on A-2 footprint

- A-2 parcel ~ 14,000 acres
- From modeling results, assume could treat ~ 60,000 ac-ft/yr with 14,000 acre STA
- Estimated Federal/State CERP Cost:
 - \$475M Construction & O&M
 - \$ 40M real estate for A-2
 - \$515M total (cost-shared)

Scenario 1
13,800 Acre STA
Existing L-21 Canal



- CONTROL STRUCTURE
- PUMP STATION (EXISTING)
- DS-1 DIVIDE STRUCTURE (NEW)
- DIVIDE STRUCTURE (EXISTING)
- SPREADER CANAL
- PS PUMP STATION (NEW)
- INVERTED SIPHON
- CONVEYANCE (NEW)
- CONVEYANCE (EXISTING)

PERTINENT INFORMATION

- STA (treatment) is the limiting factor on deliveries of new water
- FEB only works to optimize STAs, do not work independently of STA facilities (i.e cannot provide treatment needed to meet WQ compliance)
- Independent option MUST have an STA rather than a stand alone FEB only on A-2
- Stand alone STA on A-2 ~ 14,000 acres and can only treat ~ 60,000 ac-ft/yr

SCENARIO 2: Expand STA to achieve ~ benefits as A-1/A-2 FEB

- Since WQ limiting factor, what size STA would be required to achieve same benefits as FEB on A-1/A-2 option?
- From modeling results, best case scenario, assume could treat ~ 60,000 ac-ft/yr with independent 14,000 acre STA on A-2
- Assuming STA treatment capacity linearly related to STA area required:
 - 3 X 60,000 ac-ft/yr = 180,000 ac-ft/yr (~200,000 ac-ft/yr)
 - 3 X 14,000 acres = 42,000 acres STA required
 - 42,000 acre STA – 14,000 acres on A-2 = 28,000 additional acres required
- Estimated Federal/State CERP Cost:
 - \$1,000M Construction & O&M
 - \$ 196M additional real estate costs for 28K ac @ \$7k/ac
 - \$ 40M real estate for A-2
 - \$ 1,236M total (cost-shared)

PERTINENT INFORMATION

- Two primary factors that influence effectiveness of STA to reduce P concentrations are the P concentration of inflows and hydraulic loading rate
- FEB provides added benefit of reducing P concentration to STA inflows (through uptake by emergent vegetation in FEB) and optimizes hydraulic loading rate to the STA
- Thereby, reducing footprint size of independent STA required to process additional inflows from Lake Okeechobee
- In short, FEB's in combination with STA's minimize footprint needed for STA's

SCENARIO 3: Optimize expanded footprint with FEB/STA combination to achieve ~ benefits as A-1/A-2 FEB

■ Computations for Scenario 3:

$$16,500 \text{ ac (STA 3/4)} \times \frac{(150 \text{ ppb inflows (new STA inflow)})}{(80 \text{ ppb P (inflows STA 3/4 STA)})} \times \frac{200,000 \text{ Ac-ft/yr (new STA hydraulic load)}}{6000,000 \text{ ac-ft/yr (STA } \frac{3}{4} \text{ hydraulic load)}}$$

= 10.300 acres (new STA)

- Above calculation indicates that out of the 42,000 acres of STA theoretically needed to achieve 180,000 ac-ft/yr additional flow, only 10,300 acres of STA needed to treat that flow if STA optimized with reduction of inflow P concentrations and flow rates associated with an FEB
- FEB equivalent to the 32,7000 acres of additional STA was estimated to treat same volume . For a given flow, approximately 1 acre of FEB can handle the same volume as 3 acres of STA.
 - 42,000 acre STA – 10,300 acre STA = 32,700 acres STA can be substituted with FEB
 - 32,700 ac STA/3 = 10,600 acre FEB
- **Therefore, Scenario 3 footprint would be comprised of a 10,300 acre STA and 10,600 acre FEB**

SCENARIO 3: Optimize expanded footprint with FEB/STA combination to achieve ~ benefits as A-1/A-2 FEB

- Scenario 3:
 - 10,300 acre STA
 - 10,600 acre FEB
- Estimated Federal/State CERP Cost:
 - \$ 530M Construction & O&M
 - \$ 48M additional real estate costs for 6,900 ac @ \$7k/ac
 - \$ 40M real estate for A-2
 - \$ 618M total (cost-shared)

SCENARIO 4: Optimize FEB/STA combination on A-2 parcel only

- Scenario 4:
 - 6,800 acre STA
 - 7,200 acre FEB
 - Can achieve ~ 130,000 ac-ft/yr additional flow
- Estimated Federal/State CERP Cost:
 - \$ 475M Construction & O&M
 - \$ 40M real estate for A-2
 - \$ 515M total (cost-shared)

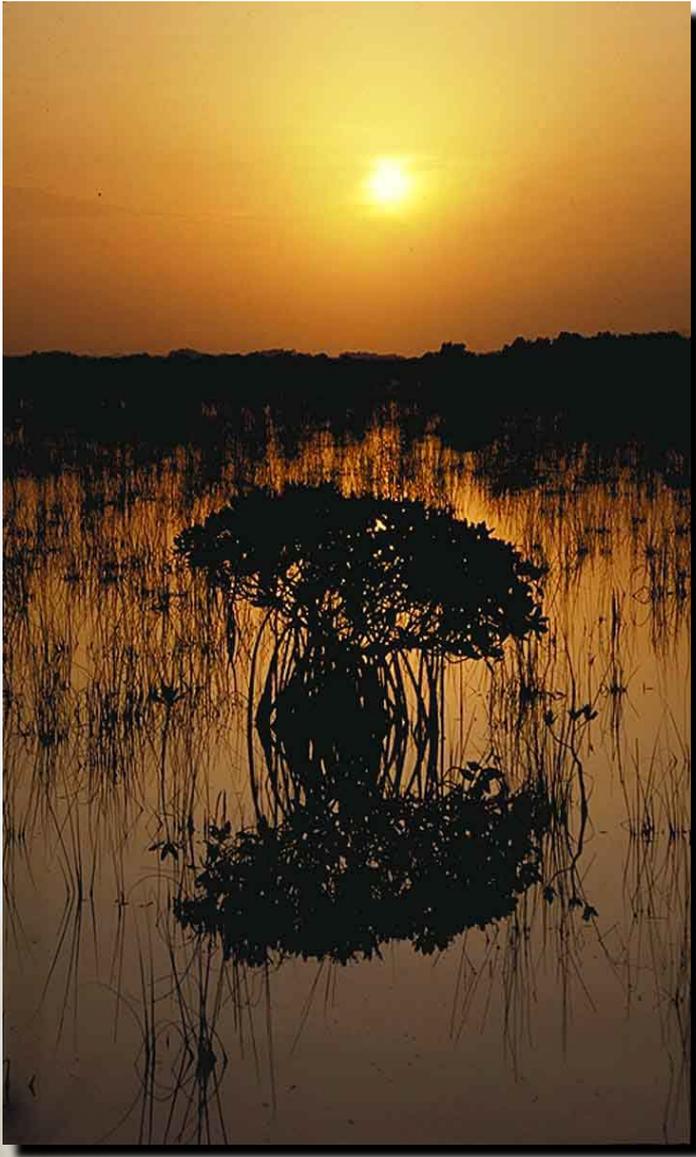
Options for EAA	Recommended Option: A1 / A2 FEB working together	Scenario 1: A-2 STA	Scenario 2: STA to provide same benefits of A1/A2 FEB	Scenario 3: STA/FEB combination	Scenario 4: STA/FEB combination
State Restoration Strategy Dependency	Dependent on State Facilities (A1-FEB, STA 3/4, Comp B)	Independent of State Facilities	Independent of State Facilities	Independent of State Facilities	Independent of State Facilities
Project Benefits: Additional flow (acre-feet/year)	200,000	60,000	200,000	200,000	130,000
Land required including A2 (acres)	14,000	14,000	42,000	20,900	14,000
Project Feature Description	14,000 acre FEB	14,000 acre STA	Additional land required: 42,000 acre STA	Additional land required: 10,300 acre STA 10,600 acre FEB	6,800 acre STA 7,200 acre FEB
Additional real estate to acquire (beyond the State-owned 14,000 acre A2) in acres	0	0	28,000	6,900	0
PROJECT COSTS					
Construction & O&M Cost	\$ 175,000,000	\$ 475,000,000	\$ 1,000,000,000	\$ 530,000,000	\$ 475,000,000
Real Estate Cost for A2	\$ 40,000,000	\$ 40,000,000	\$ 40,000,000	\$ 40,000,000	\$ 40,000,000
Additional real estate cost (@ \$7,000/acre)	\$ -	\$ -	\$ 196,000,000	\$ 48,300,000	\$ -
State compliance costs (100% non-Fed)	\$ 175,000,000	\$ 175,000,000	\$ 175,000,000	\$ 175,000,000	\$ 175,000,000
CEPP project costs to be shared	\$ 215,000,000	\$ 515,000,000	\$ 1,236,000,000	\$ 618,300,000	\$ 515,000,000
Cost per ac-ft/yr	\$ 1,075	\$ 8,583	\$ 6,180	\$ 3,092	\$ 3,962

CONCLUSIONS

- Any independent scenario results in 3-fold increase in costs for similar benefits
- Any independent scenario limited to the A-2 parcel costs 2 X as much and provides less benefits than integrated facilities
- Analyses conclude that an FEB on A-2 using State infrastructure for treatment is the most cost-effective option

RECOMMENDATIONS

- Include State remedy on A-1 in Future Without Project Condition
 - ▶ Eliminate all deep storage options on A-1
- Screen all EAA options to FEB on A-2 that utilizes State facilities for treatment
- Use A-2 FEB in all alternatives that will be considered in final array
- Develop appropriate language with State to include in PIR that defines compliance responsibilities



DISCUSSION