# Potential Connection from L-8 Canal to West Leg of C-18 Canal and ITID Improvements

WATER RESOURCES TASK FORCE MEETING
DECEMBER 18, 2024

Paul Linton, PE, PBC Water Resources Manager

# L-8 Basin Background

- Description of Drainage Area and challenges
- Description of Water Supply Demands

# L-8 Basin Drainage Area

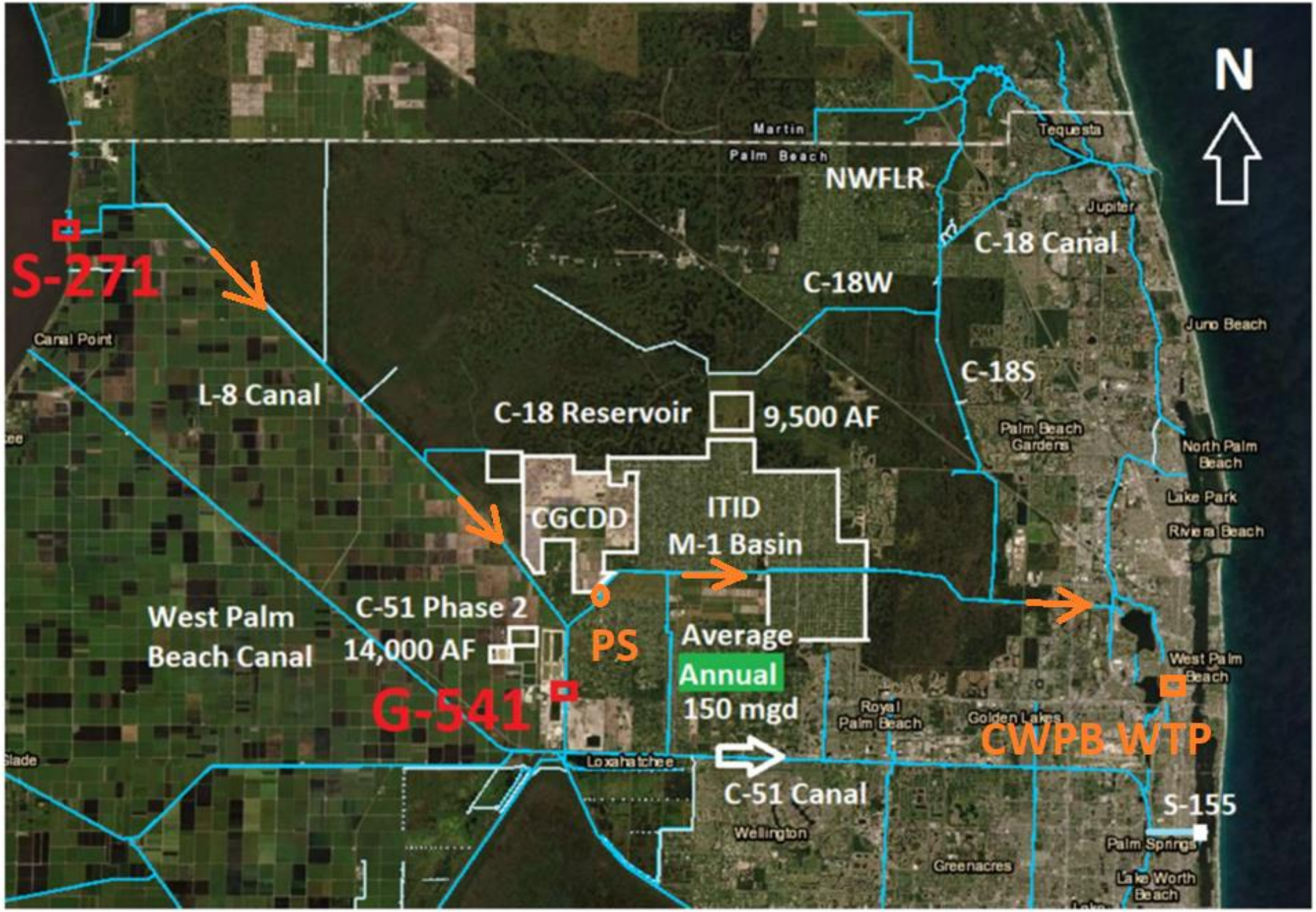
The L-8 Basin receives excess water from CGCDD, ITID, J.W. Corbett WMA, Dupuis Wildlife Preserves, EAA (4,640 acres of the Bourne Two Area), and the White Fences and Deer Run Developments. With resolution of the pump station issues for White Fences, CGCDD and ITID are the most impacted by high water in the L-8 Canal.

# L-8 Basin Drainage Area

Total Area on the order of 171.2 square miles (109,568 acres). J. W. Corbett WMA and Dupuis Wildlife Preserve make up about 62,600 acres. Using a drainage rate of 0.25 inches per day these areas generate about 660 cfs.

Using an average of 0.75 inches per day for the remaining 46,968 acres the discharge is 1,479 cfs. The 46,968 acres includes ITID and CGCDD.

<u>These flows total about 2,139 cfs</u>. This number is an order of magnitude estimate (some flows are throttled by hydraulics).


N
Martin
Palm Beach
NWFLR
Tequesta
Jupiter
C-18 Canal
S-271
C-18W
Juno Beach
Canal Point
C-18S
L-8 Canal
C-18 Reservoir
9,500 AF
Palm Beach Gardens
North Palm Beach
Lake Park
Riviera Beach
CGCDD
ITID
M-1 Basin
West Palm Beach Canal
C-51 Phase 2
14,000 AF
PS
Average Annual 150 mgd
West Palm Beach
G-541
Royal Palm Beach
Golden Lakes
CWPB WTP
Loxahatchee
C-51 Canal
S-155
Wellington
Palm Springs
Greenacres
Lake Worth Beach

# L-8 Basin Water Supply

The maximum monthly water supply demands from Lake Okeechobee through the L-8 Canal are about:

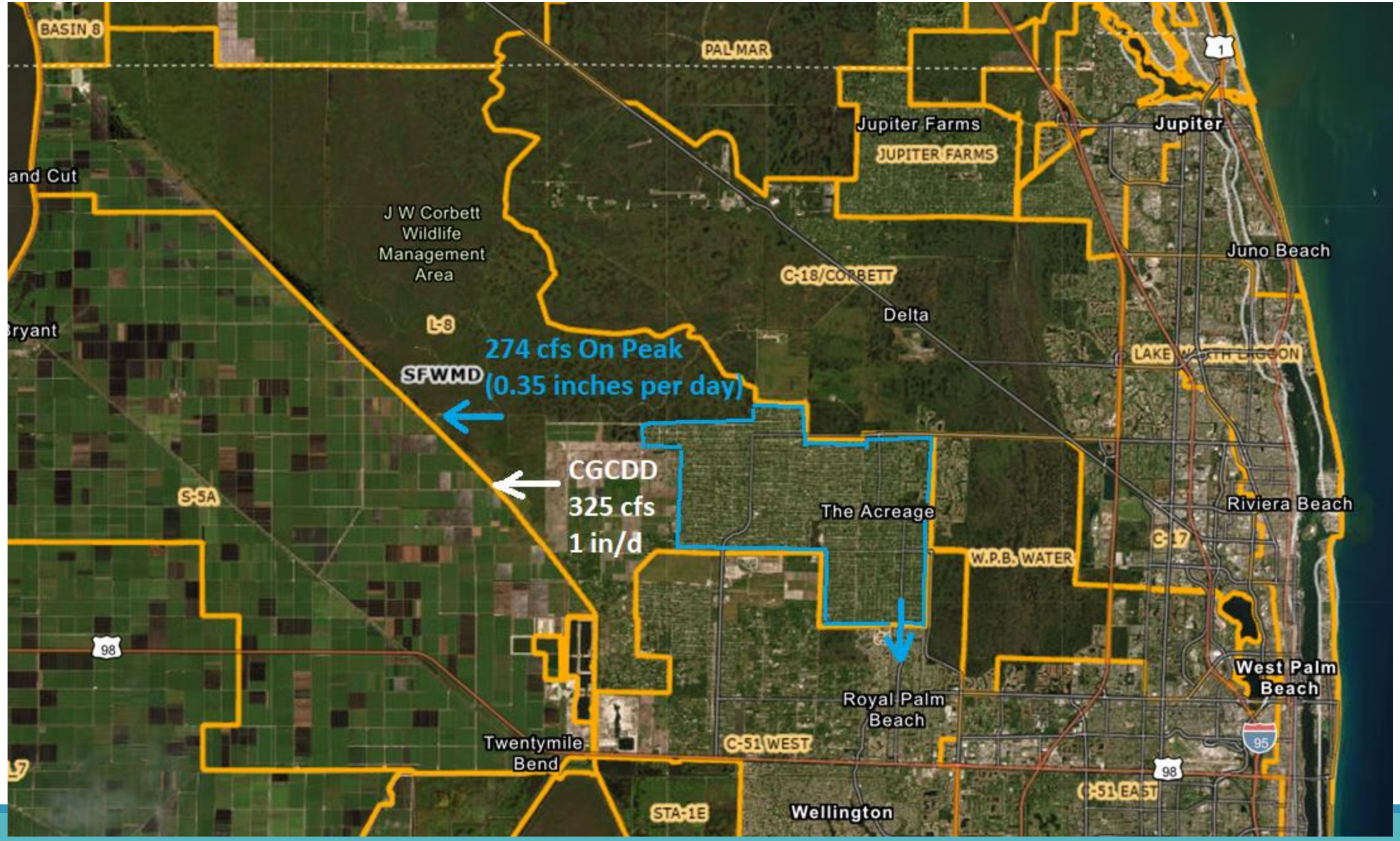
- 140 cfs for City of West Palm Beach (CWPB)
- 50 cfs for Cypress Grove Community Development District
- 0 to 100 cfs Lake Worth Drainage District (alternative route)
- Everglades Agriculture Area irrigation

# L-8 Basin Water Supply Issues

Currently during extended dry periods, the Lake Okeechobee is the only source of water with the following issues:

- Limited conveyance capacity of the L-8 Canal.
- Water quality of Lake Okeechobee varies considerably with suspended solids and algae impacting CWPB WTP.
- Chloride contents rises during low water conditions reaching levels that exceed the drinking water standard.
- With ITID discharging almost all of their runoff to tide less water is available for CWPB and Lake Okeechobee.

# ITID Drainage Rates and Potential Projects to Increase ITID Drainage Rates


BASIN 8
PAL MAR
Jupiter Farms
JUPITER FARMS
Jupiter
and Cut
J W Corbett
Wildlife
Management
Area
Juno Beach
C-18/CORBETT
Delta
Bryant
L-8
274 cfs On Peak
(0.35 inches per day)
SFWMD
CGCDD
325 cfs
1 in/d
S-5A
The Acreage
Riviera Beach
W.P.B. WATER
C-17
98
West Palm
Beach
Royal Palm
Beach
Twentymile
Bend
C-51 WEST
95
98
C-51 EAST
STA-1E
Wellington

# ITID Drainage Limitations

- ITID's permitted discharge to the L-8 Canal is 274 cfs. This combined with the 200 cfs of on-peak capacity to the C-51 Canal provides a drainage rate of 0.43 inches per day.
- ITID main pump station has five 222.8 cfs units providing a total capacity of 1,114 cfs (~700 mgd) which pump into their an existing ~700-acre impoundment
- ITID pumps into the reservoir at the full rates, while releasing water, until the reservoir is full, (~2 days), then pumps at 274 cfs.

# Potential ITID Improvements

- ITID has land, with transition requirements, for construction of an additional 640-acre impoundment located along the east side of the existing impoundment.
- The 640-acre impoundment would allow ITID to pump at their full capacity for about two more days.
- This increases the drainage rate from 0.43 to 1.2 inches per day for those days.

# Potential ITID Improvements

- If storage volume is dedicated in the C-51 Reservoir Phase 2, ITID could with a SFWMD permit increase there discharge to the L-8 Canal while storage is available.
- From an operational simplicity and post storm recovery perspective ITID would benefit if it could continuously operate 2 (446 cfs) or 3 units (669 cfs). This would increase ITID on peak drainage capacity from 0.42 to 0.58 and 0.78 inches per day; respectively.

# Potential ITID Improvements

- The culverts connecting ITID Discharge Canal to the L-8 Canal are old and had to be lined with smaller culverts to prevent failure.
- Velocities for increased flow would be quite high likely warranting replacement.
  - for 2 units (446 cfs) 9.3 fps
  - for 3 units (669 cfs) 14.0 fps

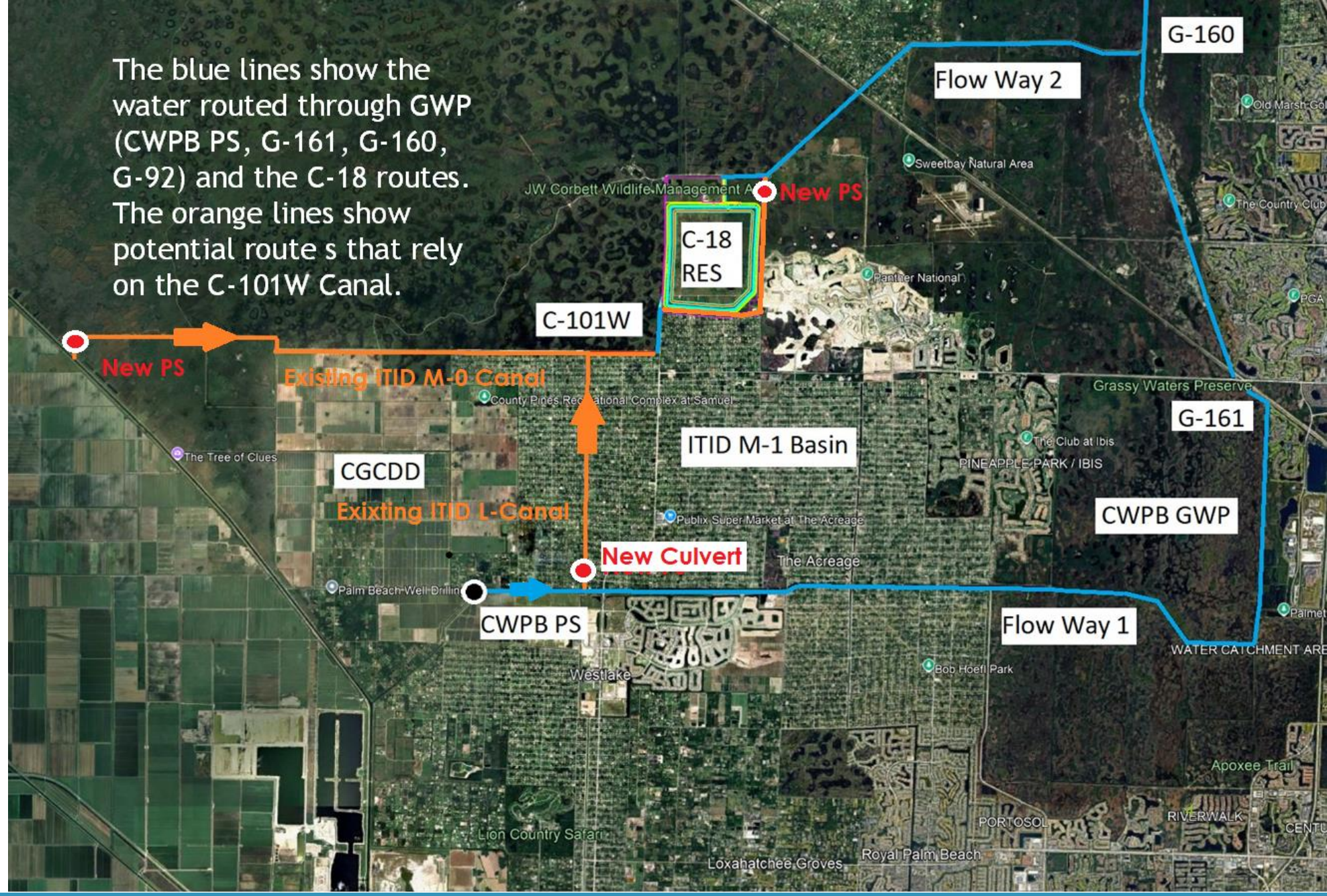
# Potential Water Route from L-8 Basin to Northwest Fork of the Loxahatchee River (NWFLR) through the West Leg of the C-18 Canal.

Previous work determined that the only feasible/economical route from ITID to the PBC Land is through the canal to be built as part of the CERP LRWRP C-18 Reservoir.

The C-101W/L-101W will be located along the west side of Seminole Pratt & Whitney Road and connect the C-18 Reservoir to ITID M-0 Canal where it could be connected to PBC drainage system.

Figure shows two potential routes from L-8 Canal to C-18 Canal.

The CWPB routes would use the CWPB existing pump stations.




This slide was updated post presentation – see meeting minutes for details.

# Update on Construction Schedule for LRWR Project's C-18W Impoundment

- Reservoir and associated canal delayed a year due to extensive (good) evolution in the design
- Construction of the canal connecting ITID to PBC lands (C-101W/L-101W) could begin in 2028 pending District leadership approval
- Construction of the impoundment will likely begin in mid-2029.

# Route through PBC Lands

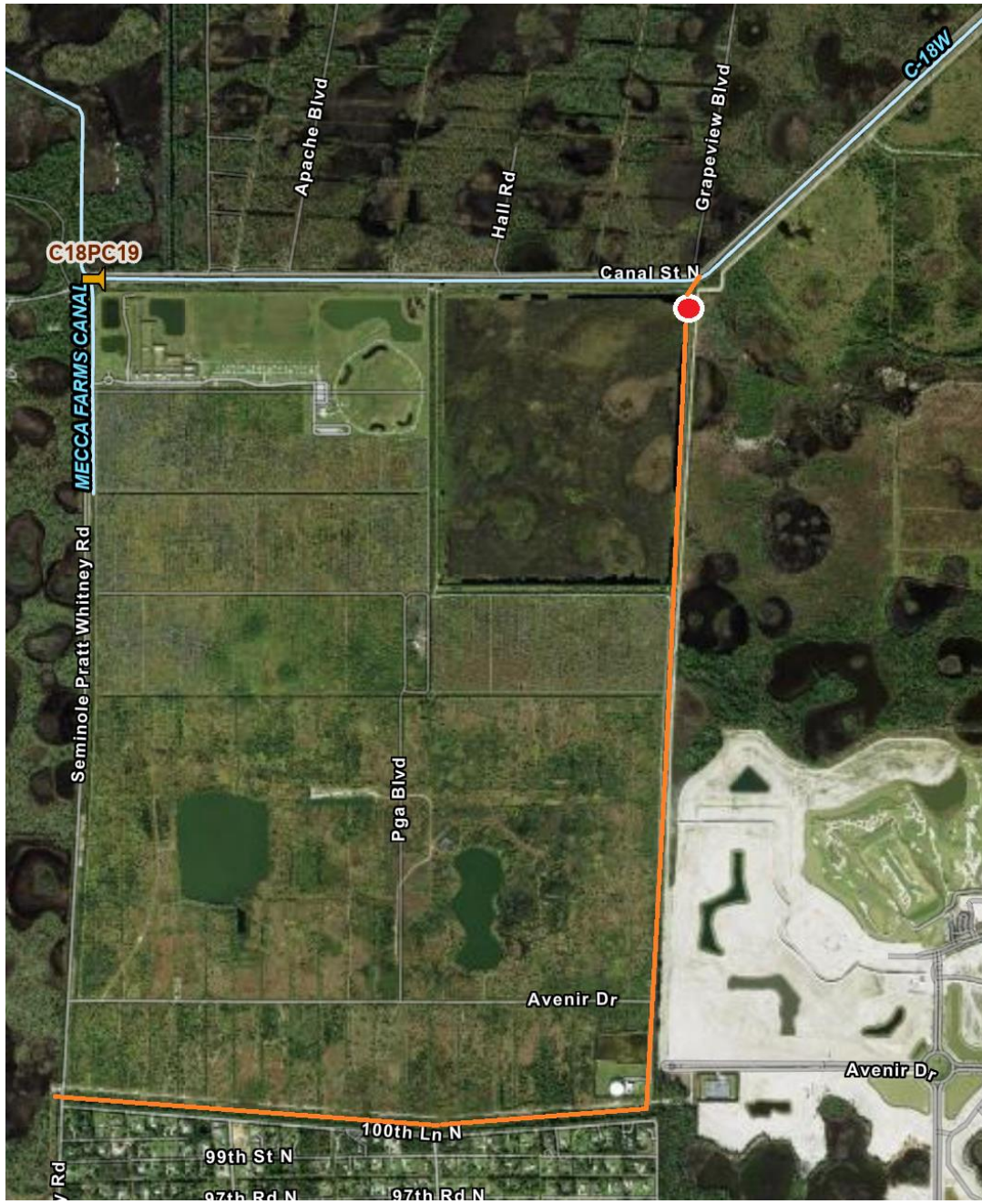
PBC owns land along the south and east side of what was Mecca Farms and will be the C-18W Reservoir.

The existing canal and pump station within PBC land can convey water from the southwest corner of this parcel to the West Leg of the C-18 Canal

The four 5-mgd ASR wells identified in the CERP LRWRP will provide a supply rate of about 31 cfs.

PBC drainage must be separated SFWMD. Work will likely include the following:

- 10 to 40 cfs PS at about 1,200,000 to $3,200,000
- 0.75 mile long 3 feet high levee at ~$1,500,000
- 72-inch culvert connection to C-101 ~750,000



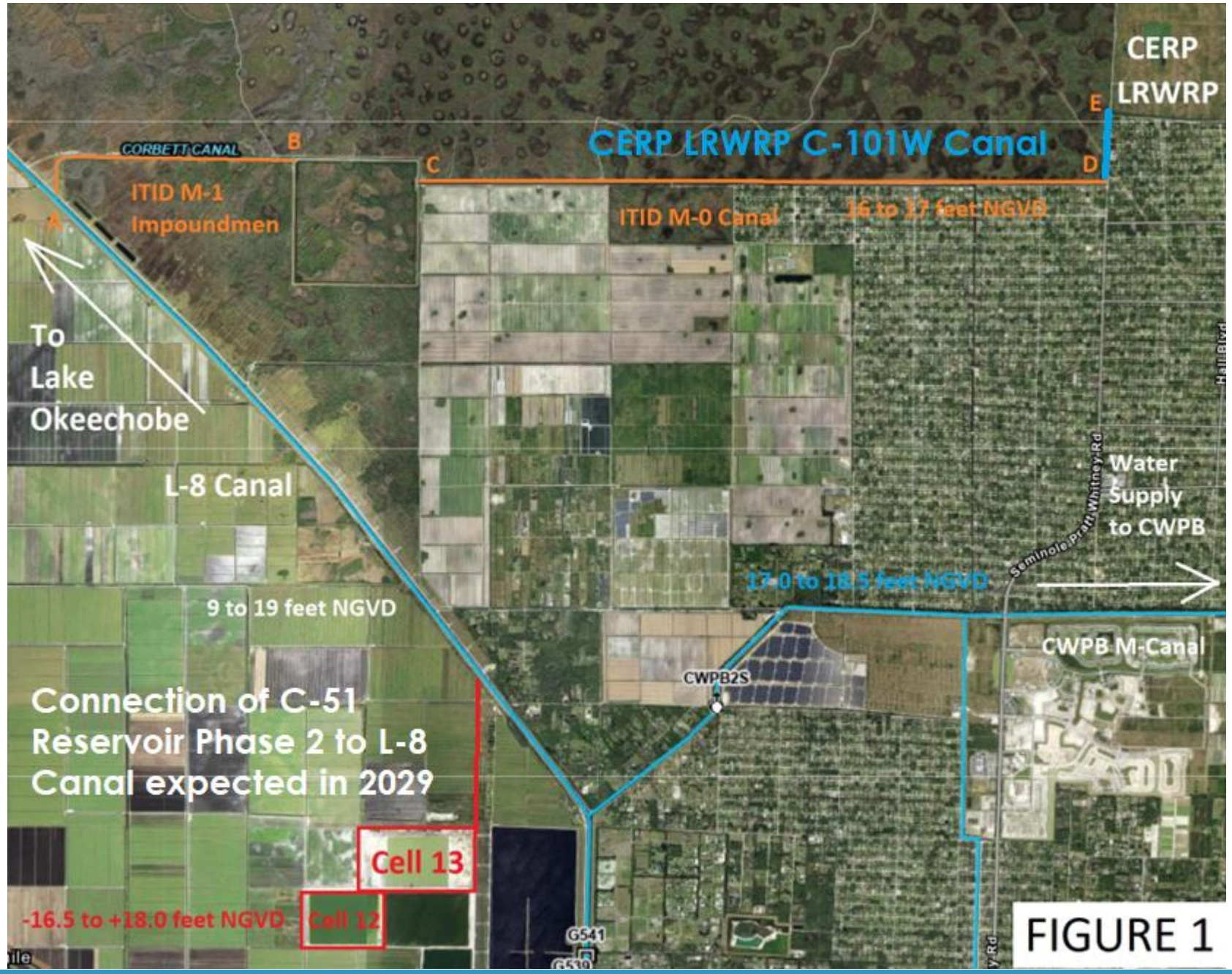
# Long Term Changes to ITID system to provide more capacity and two way flow.

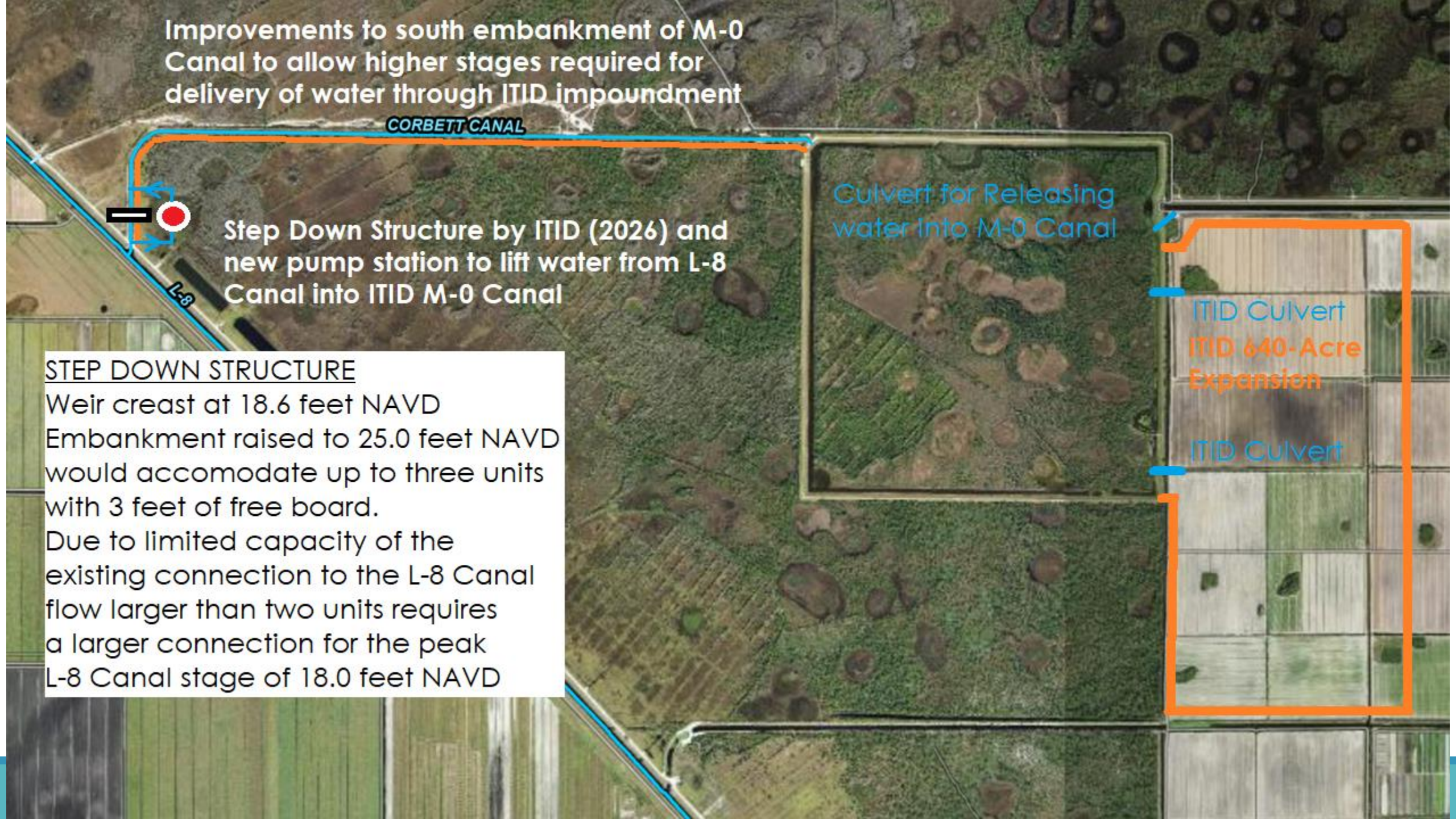
# Changes

Several changes are required to allow two-way flow from the L-8 Canal to the East End of ITID M-0 Canal where the CERP LRWRP can access it.

Some of these changes would have flood risk reduction benefits.

This could include 640-acre expansion of ITID impoundment (not shown)




Improvements to south embankment of M-0 Canal to allow higher stages required for delivery of water through ITID impoundment
CORBETT CANAL
Step Down Structure by ITID (2026) and new pump station to lift water from L-8 Canal into ITID M-0 Canal
L-8
Culvert for Releasing water into M-0 Canal
ITID Culvert
ITID 640-Acre Expansion
ITID Culvert
STEP DOWN STRUCTURE
Weir creast at 18.6 feet NAVD
Embankment raised to 25.0 feet NAVD would accomodate up to three units with 3 feet of free board.
Due to limited capacity of the existing connection to the L-8 Canal flow larger than two units requires a larger connection for the peak L-8 Canal stage of 18.0 feet NAVD

Order of Magnitude Cost

$3 M  to raise 2.25 miles of levee to 25.0 feet NAVD with toe road ($200 per LF).

1 M for Culvert to release from M-1 Impoundment into ITID M-0 Canal.

$15 M for 50 cfs pump station to lift water from L-8 Canal ($300,000 per cfs)

$10 M to replace L-8 Culverts for 700 cfs

# Thank You

## Questions/Discussion

Photo: Katelyn Cucinotta