LWDD Governing Board Workshop
October 7, 2025
Final Meeting Materials

District-Wide Modeling Effort

Tommy Strowd, P.E.
Executive Director

Anthony LasCasas P.E.
Director of Operations & Maintenance

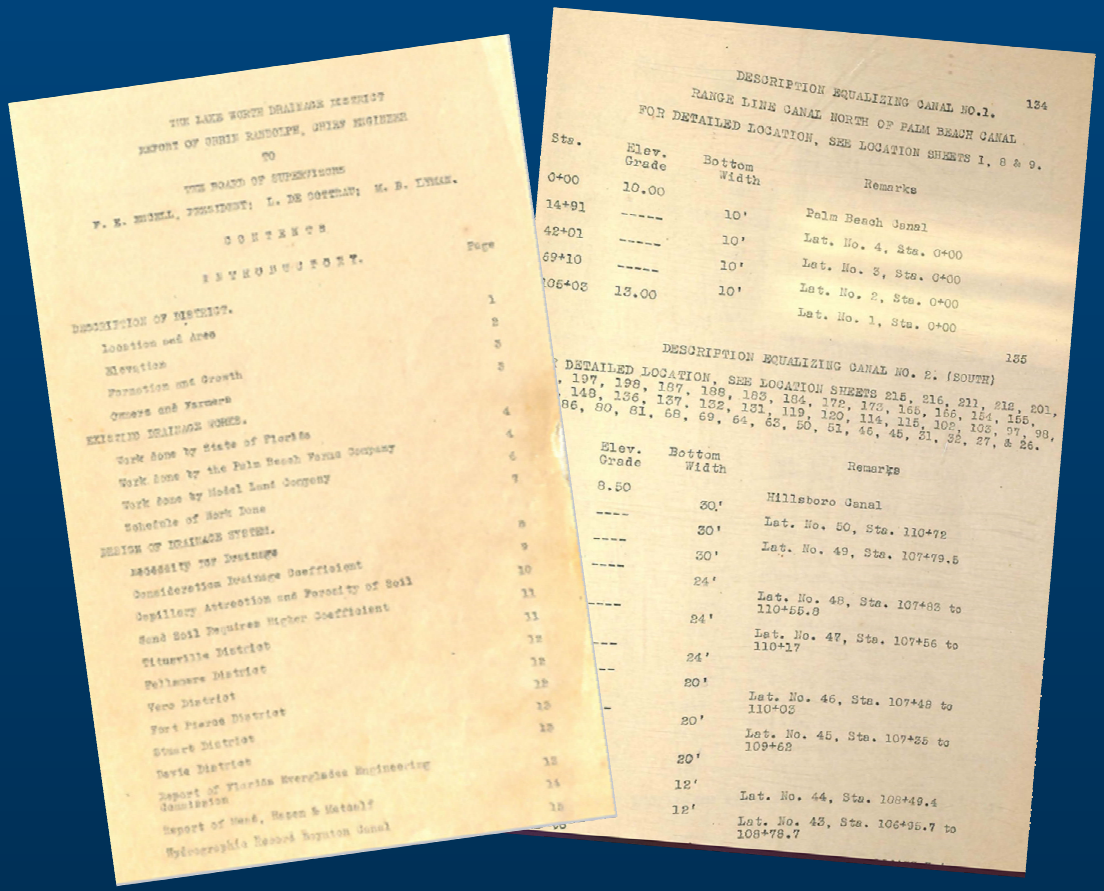
Board Workshop – October 7, 2025
Agenda Item #3

MOCK • ROOS
CONSULTING ENGINEERS

LAKE WORTH DRAINAGE DISTRICT
LWDD
Water Managers Since 1915

Historical Study & Modeling Efforts

- 1916 - Report of Orrin Randolph, Chief Engineer
  - Outlined the initial “Plan of Reclamation”



THE LAKE WORTH DRAINAGE DISTRICT
REPORT OF ORRIN RANDOLPH, CHIEF ENGINEER
TO
THE BOARD OF SUPERVISORS
F. E. BUSELL, PRESIDENT; L. DE COTTLAR; M. B. LYMAN.

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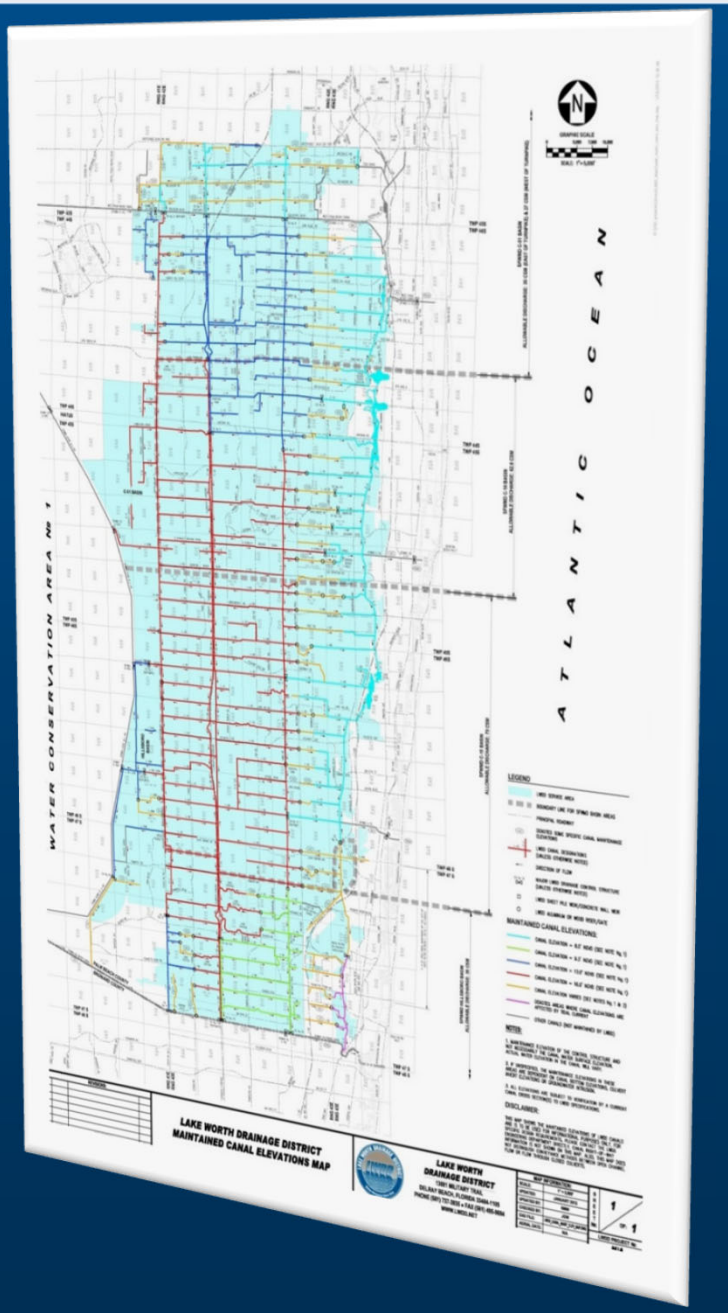
DESCRIPTION EQUALIZING CANAL NO.1. 134
RANGE LINE CANAL NORTH OF PALM BEACH CANAL
FOR DETAILED LOCATION, SEE LOCATION SHEETS 1, 8 & 9.

Sts.	Elev. Grade	Bottom Width	Remarks
0+00	10.00		
14+91	-----	10'	Palm Beach Canal
42+01	-----	10'	Lat. No. 4, Sta. 0+00
69+10	-----	10'	Lat. No. 3, Sta. 0+00
106+02	13.00	10'	Lat. No. 2, Sta. 0+00
			Lat. No. 1, Sta. 0+00

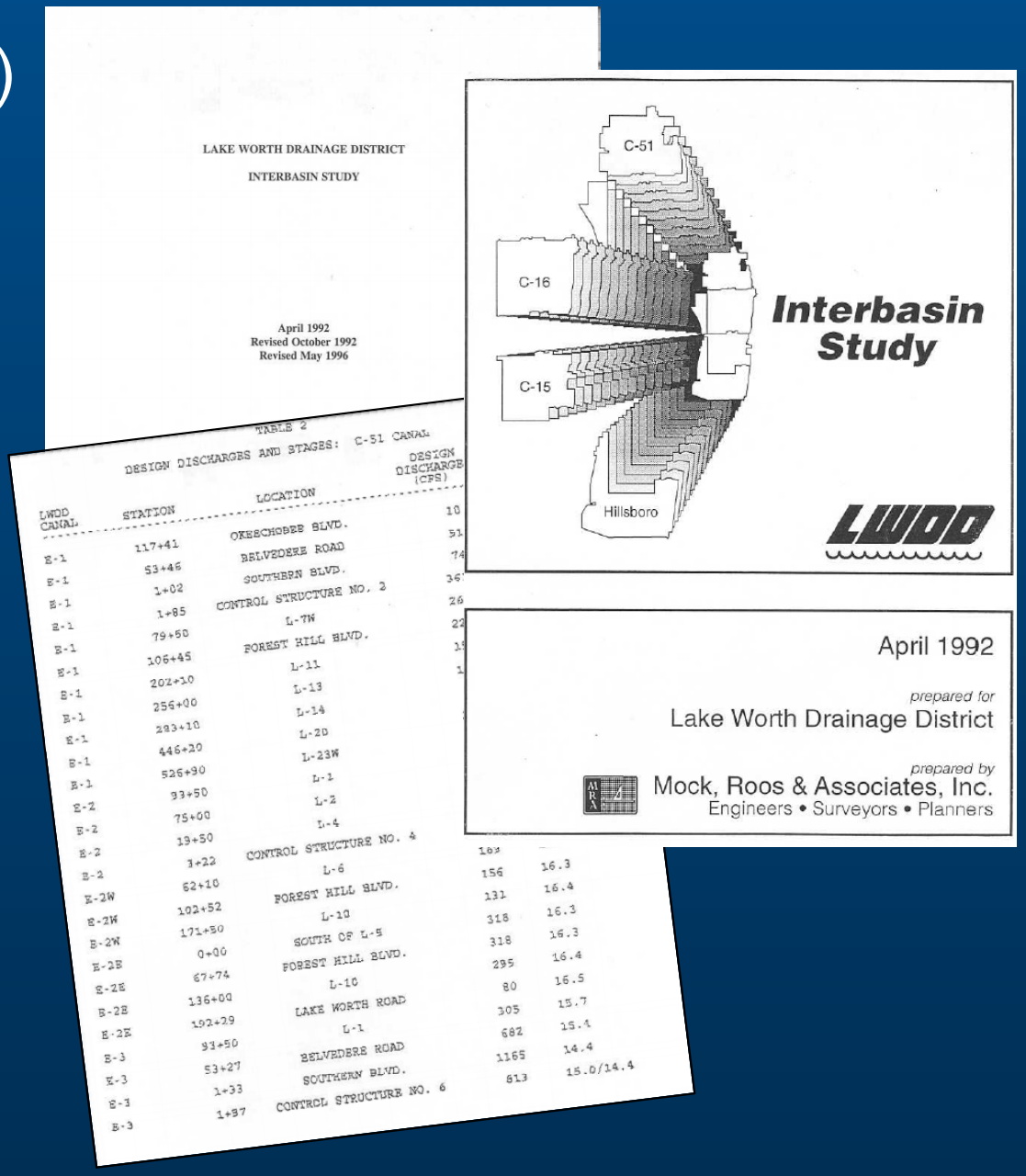
DESCRIPTION EQUALIZING CANAL NO. 2. (SOUTH) 135
DETAILED LOCATION, SEE LOCATION SHEETS 215, 216, 211, 212, 201, 197, 198, 187, 188, 183, 184, 172, 173, 155, 156, 154, 155, 148, 136, 137, 132, 131, 119, 120, 114, 115, 102, 103, 97, 98, 86, 80, 81, 68, 69, 64, 62, 50, 51, 46, 45, 21, 32, 27, & 26.

Elev. Grade	Bottom Width	Remarks
8.50		
----	30'	Hillsboro Canal
----	30'	Lat. No. 50, Sta. 110+72
----	30'	Lat. No. 49, Sta. 107+79.5
	24'	
----		Lat. No. 48, Sta. 107+83 to 110+55.8
	24'	
---		Lat. No. 47, Sta. 107+56 to 110+17
--	24'	
	20'	
-		Lat. No. 46, Sta. 107+48 to 110+02
	20'	
		Lat. No. 45, Sta. 107+25 to 109+62
	20'	
	12'	
	12'	Lat. No. 44, Sta. 108+49.4
		Lat. No. 43, Sta. 106+95.7 to 108+78.7



Historical Study & Modeling Efforts

- 1992 (Revised May 1996) – LWDD Interbasin Study by Mock Roos & Associates
  - Reviewed existing hydraulic conveyance of District's canal network as constructed ~75 years earlier and subsequently modified thereafter



LAKE WORTH DRAINAGE DISTRICT

INTERBASIN STUDY

April 1992
Revised October 1992
Revised May 1996

TABLE 2

DESIGN DISCHARGES AND STAGES: C-51 CANAL

LWDD CANAL	STATION	LOCATION	DESIGN DISCHARGE (CFS)	
E-1	117+41	OKEECHOBEE BLVD.	10	
E-1	53+46	BELVEDERE ROAD	51	
E-1	1+02	SOUTHERN BLVD.	74	
E-1	1+85	CONTROL STRUCTURE NO. 2	36	
E-1	79+50	L-7W	26	
E-1	106+45	FOREST HILL BLVD.	22	
E-1	202+10	L-11	1	
E-1	256+00	L-13	1	
E-1	283+10	L-14		
E-1	446+20	L-20		
E-1	526+90	L-23W		
E-2	93+50	L-1		
E-2	75+00	L-2		
E-2	19+50	L-4		
E-2	3+22	CONTROL STRUCTURE NO. 4		
E-2W	62+10	L-6	156	16.3
E-2W	102+52	FOREST HILL BLVD.	131	16.4
E-2W	171+50	L-10	318	16.3
E-2E	0+00	SOUTH OF L-5	318	16.3
E-2E	67+74	FOREST HILL BLVD.	295	16.4
E-2E	136+00	L-10	80	16.5
E-2E	192+29	LAKE WORTH ROAD	305	15.7
E-3	93+50	L-1	682	15.4
E-3	53+27	BELVEDERE ROAD	1165	14.4
E-3	1+33	SOUTHERN BLVD.	613	15.0/14.4
E-3	1+97	CONTROL STRUCTURE NO. 6		

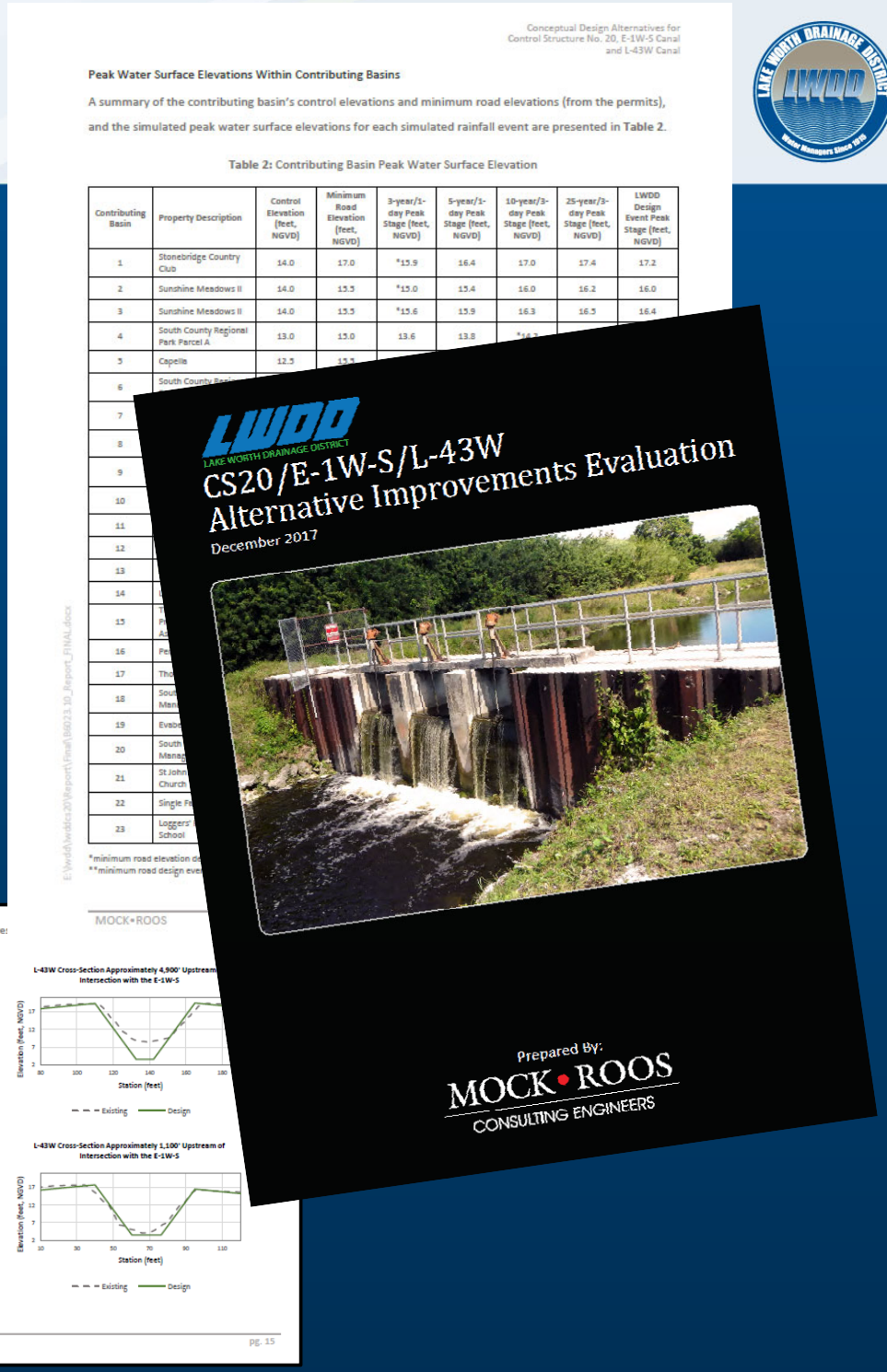
April 1992

prepared for
Lake Worth Drainage District

prepared by
Mock, Roos & Associates, Inc.
Engineers • Surveyors • Planners

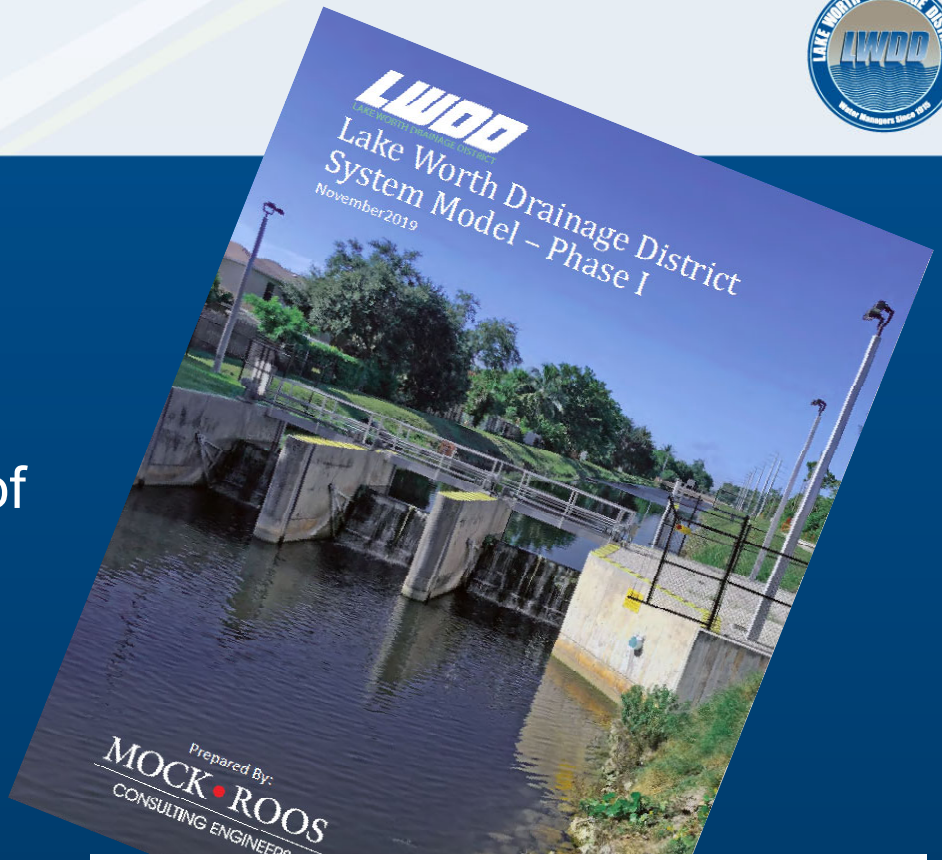
Modeling Efforts

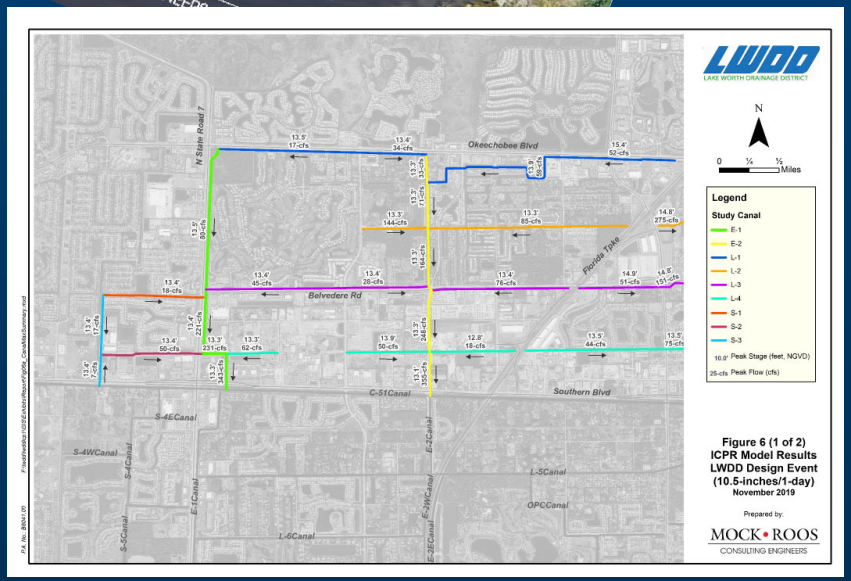
- 2017 – E-1WS
  - Specific modeling of the E-1WS, south of Control Structure 20
    - Identified improvements (replace E-1WS outfall culverts) and determined that others (canal expansion) were not cost effective
    - Construction of improvements completed June 2020



Modeling Efforts

- 2019 – North Basin ICPR Pilot Study
  - Limited ICPR model for area north of C-51
  - Identified methodology and cost savings approach for future models
  - Provides a complete model for the area for evaluation of permit requests and re-alignment options to provide better access to low maintenance bank



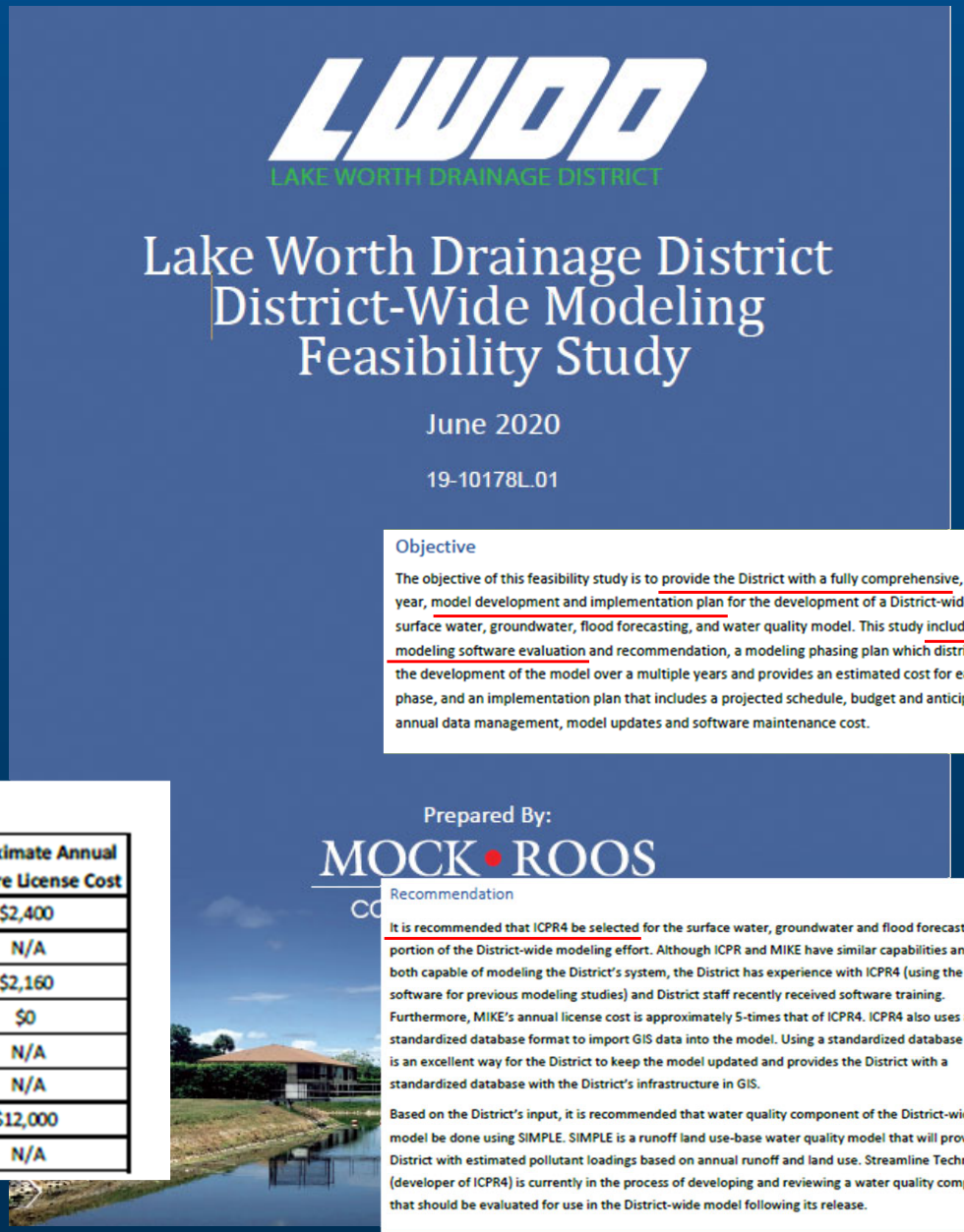


Modeling Efforts

- 2020 – Modeling Feasibility Study
- Objective
  - Provide the District with a fully comprehensive model development plan.
  - Includes a modeling software evaluation
- Recommendation
  - It was recommended that ICPR 4 be selected

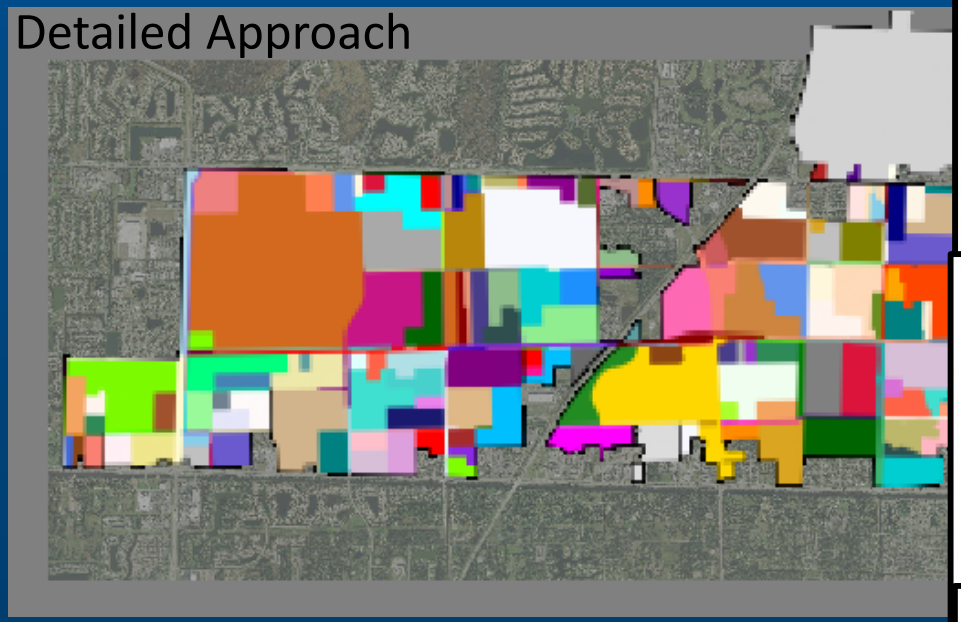
Table 1: Summary of Software Capabilities

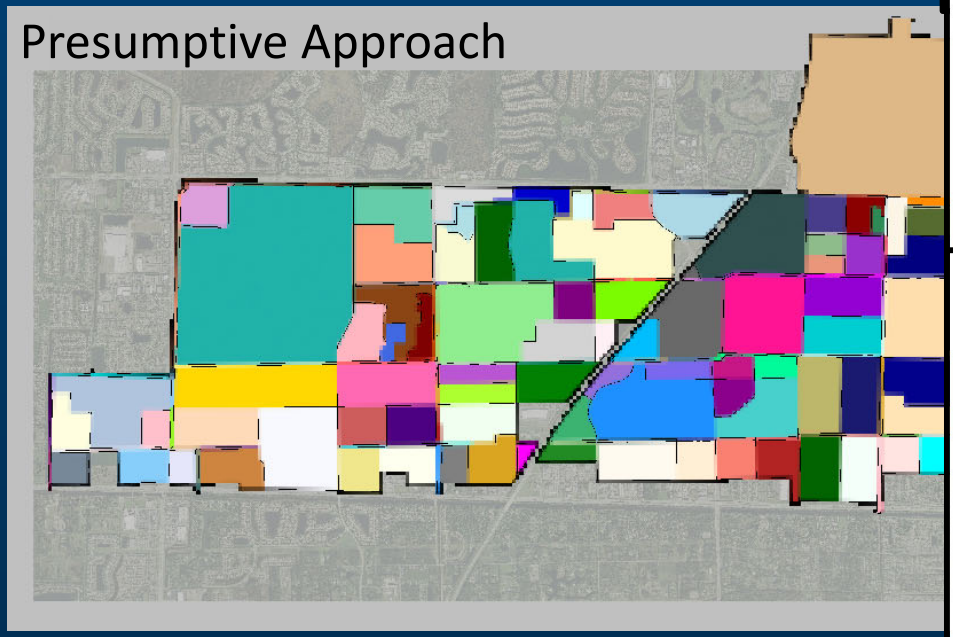
Software	Surface Water	Ground Water	Water Quality	Forecasting	GIS	Public/ Private	Approximate Annual Software License Cost
ICPR4	X	X	X	X	X	Private	$2,400
SWMM	X	X	X			Public	N/A
PCSWMM	X	X	X	X	X	Private	$2,160
WAM	X	X	X		X	Private	$0
HEC Software	X	X		X	X	Public	N/A
SIMPLE			X		X	Public	N/A
MIKE11 and MIKE HYDRO River	X	X	X	X	X	Private	$12,000
MODFLOW		X				Public	N/A

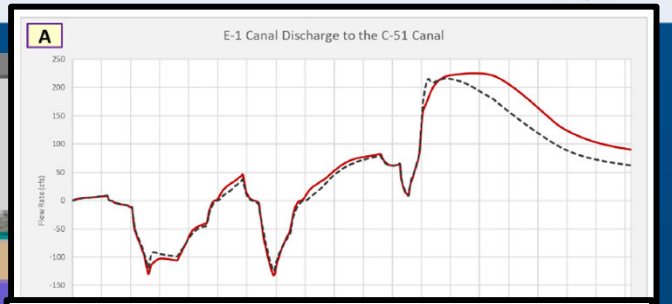


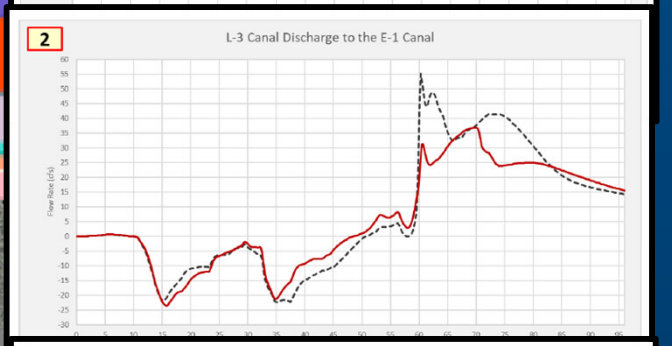
District-Wide ICPR4 Surface Water Model Progress Update

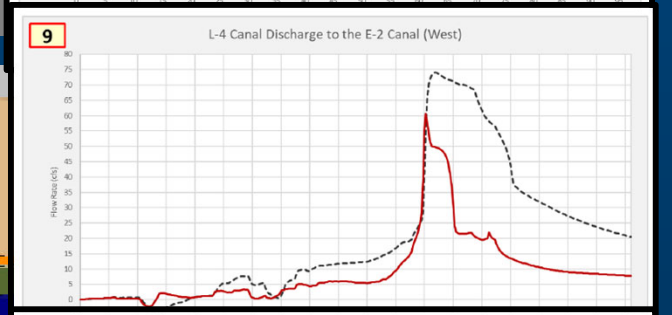
- 2021 – Presumptive Approach Study
  - Developed and validated Presumptive Approach
    - *Detailed Approach*: include existing stormwater system details
    - *Presumptive Approach*: Estimates runoff characteristics

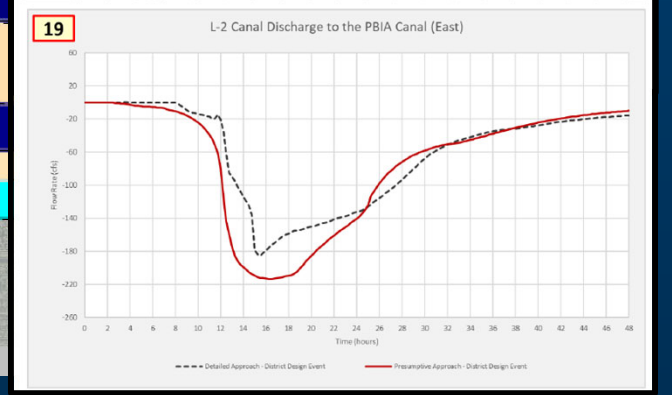






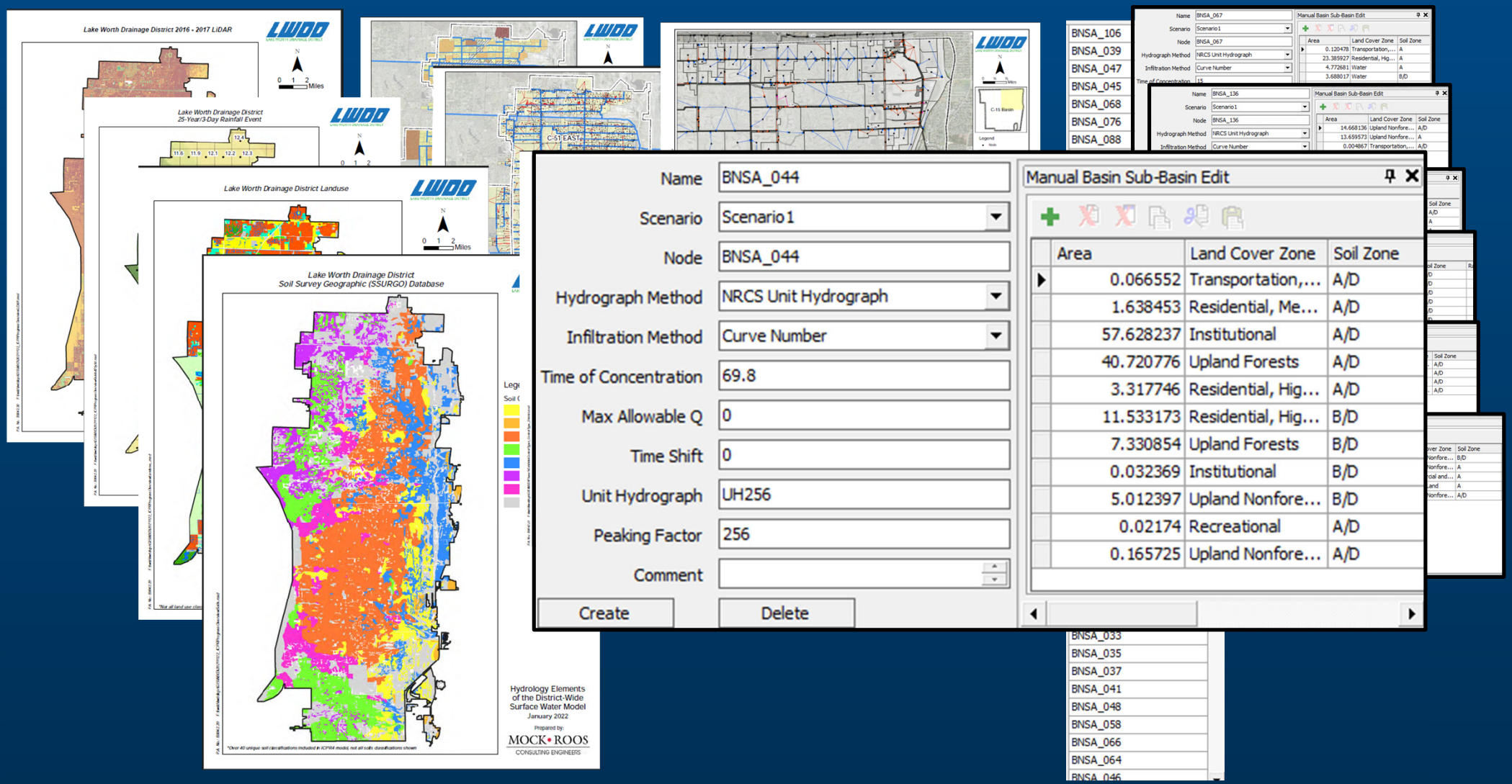






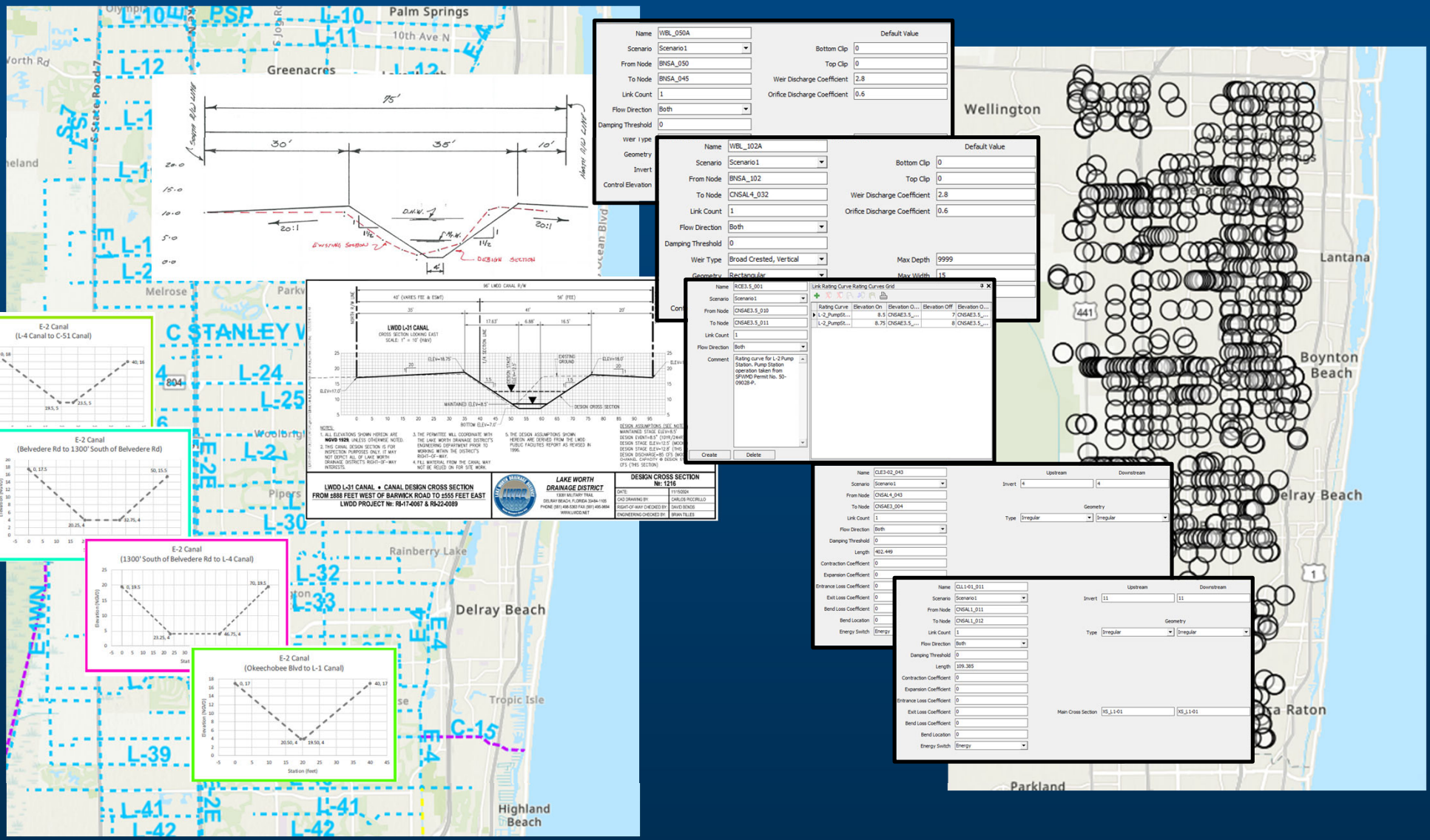
Modeling Efforts

- Phase 1 HYDROLOGY (Rainfall & Runoff)
  - Defining over **3,100** individual Basins and **3,800** points of Connections (Hydrographs)

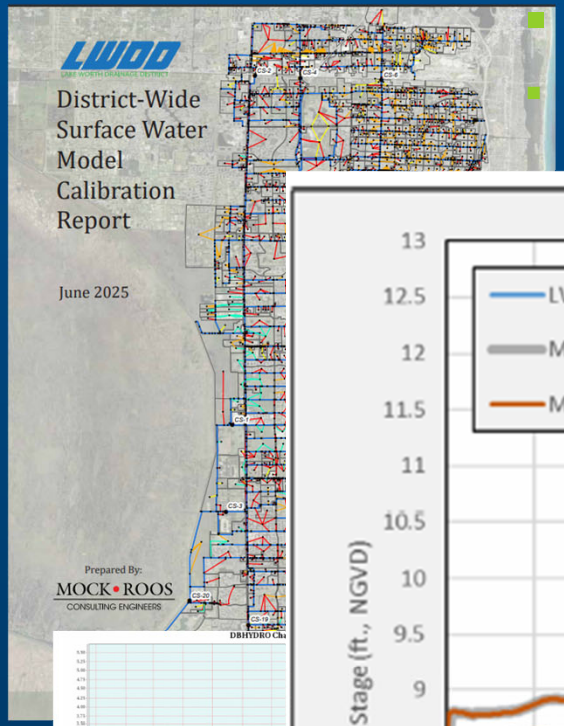


Modeling Efforts

- Phase 2 HYDRAULICS (Channels, Pipes & Controls)
  - Defining **4,000** Channel Reaches, **800** Culverts & Pipes, and **80** Control Structures & Weirs



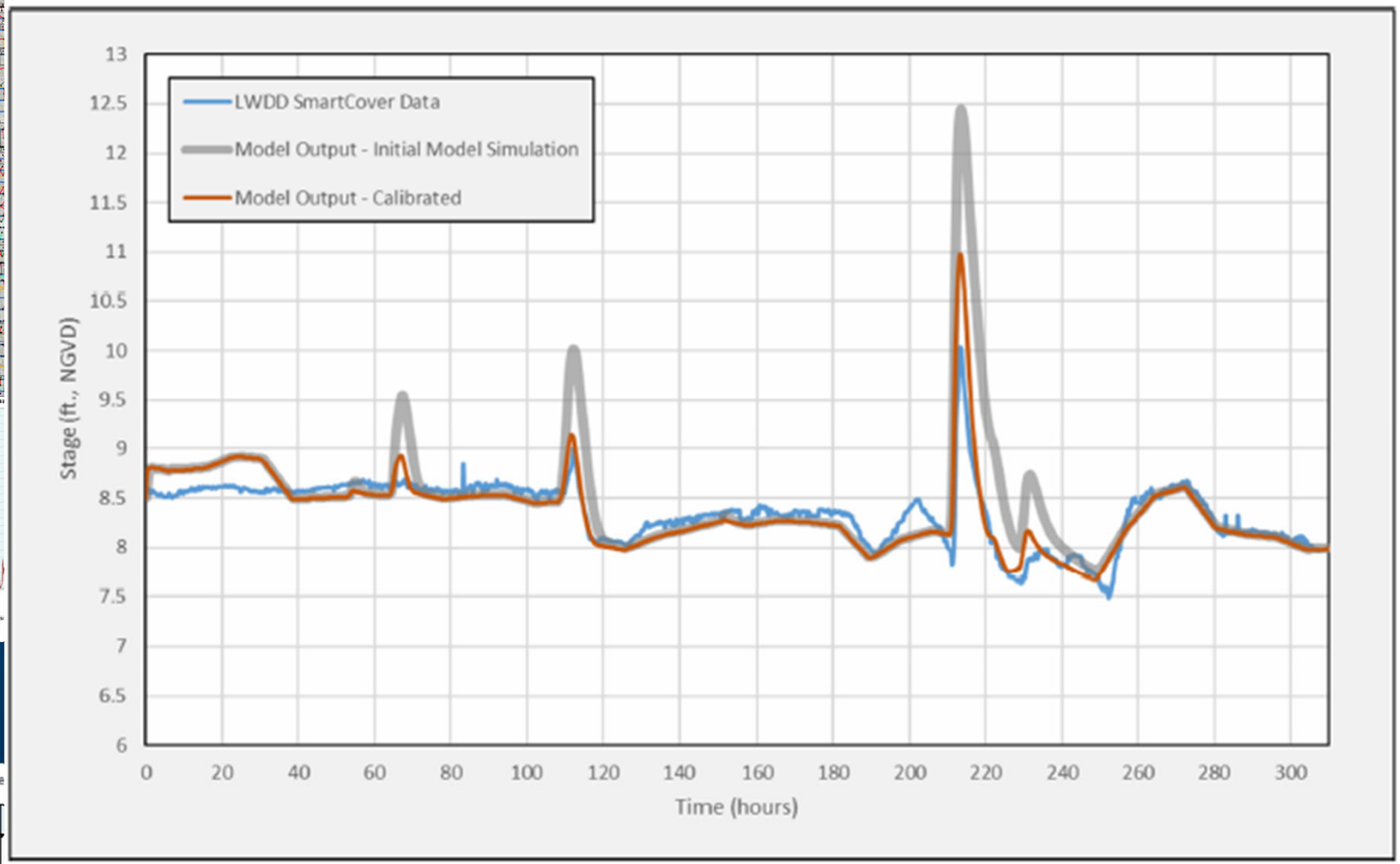
Modeling Efforts

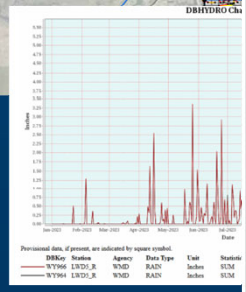


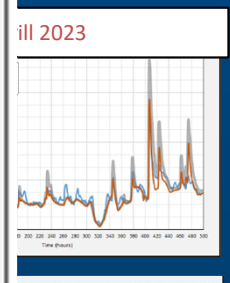
Calibration Study – technical details

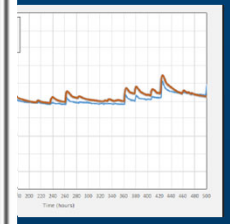
Model was calibrated using separate storm events and 22 water level gages

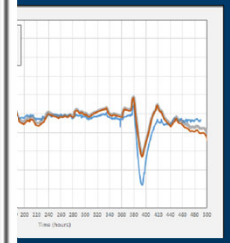
- Included

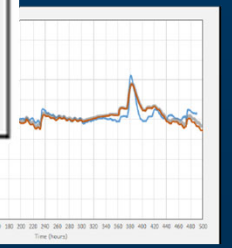






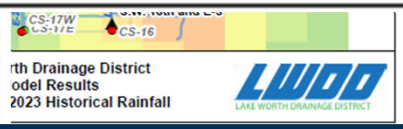






Table

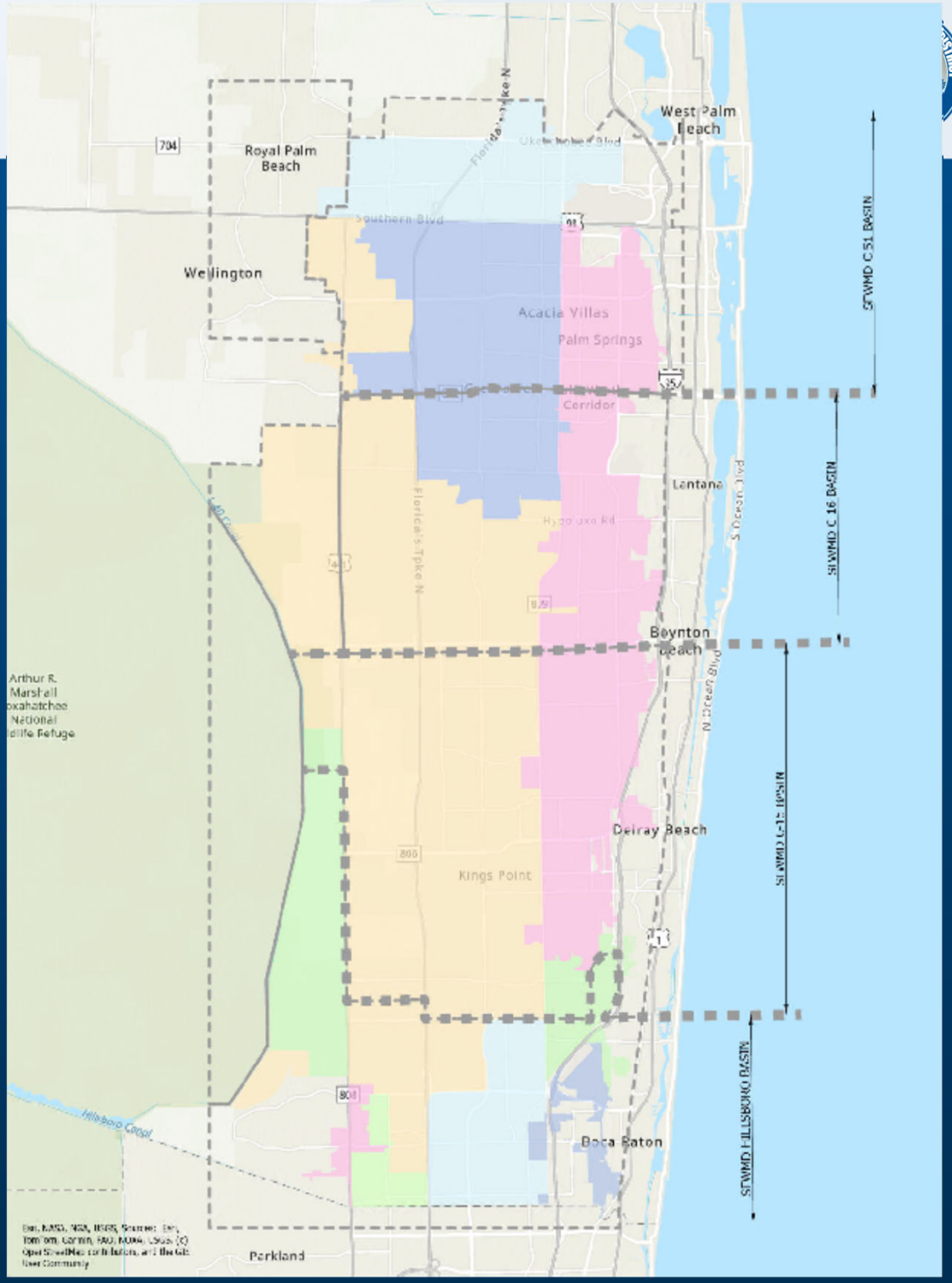
Flow Condition			
Control Submerged (C_d)			
Control Free (C_d)	0.67	0.64	0.655
Uncontrolled Submerged (C_d)	0.9	0.9	0.9
Uncontrolled Free (C_d)	3.6	3.7	3.65



E-4 and Park of Commerce

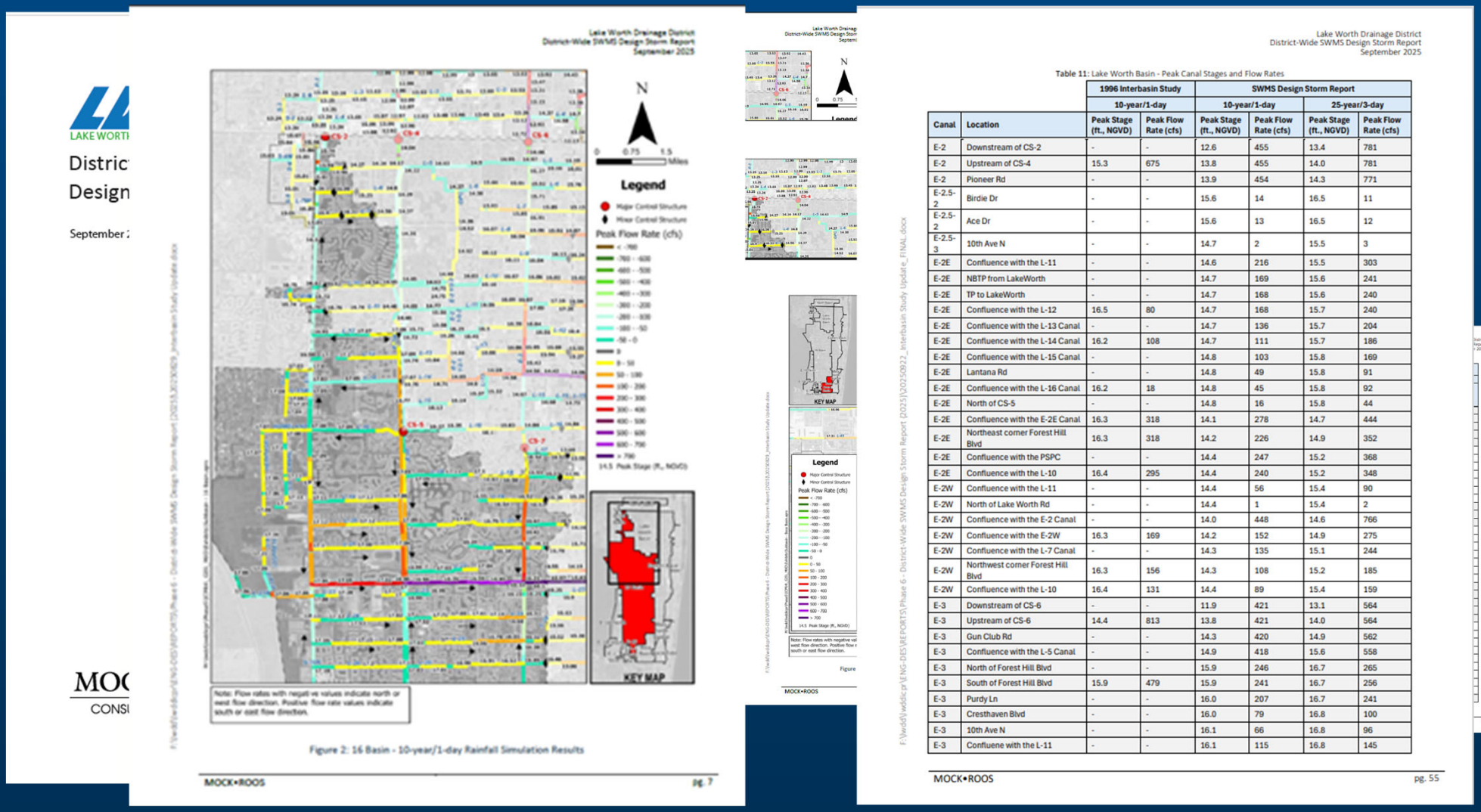
Key Features

- Basin Boundaries
  - Analyzed the District based on physical controls vs. assumed SFWMD basin divides
- Higher Level of Hydrologic and Hydraulic Detail
- 22 Calibration Points



2025 – SWMS Design Storm Report

- FINAL PHASE - Design Storm Report
  - Updates 1996 Interbasin Study



Lake Worth Drainage District
District-Wide SWMS Design Storm Report
September 2025

Table 11: Lake Worth Basin - Peak Canal Stages and Flow Rates

Canal	Location	1996 Interbasin Study 10-year/1-day Peak Stage (ft., NGVD)	1996 Interbasin Study 10-year/1-day Peak Flow Rate (cfs)	SWMS Design Storm Report 10-year/1-day Peak Stage (ft., NGVD)	SWMS Design Storm Report 10-year/1-day Peak Flow Rate (cfs)	SWMS Design Storm Report 25-year/3-day Peak Stage (ft., NGVD)	SWMS Design Storm Report 25-year/3-day Peak Flow Rate (cfs)
E-2	Downstream of CS-2	-	-	12.6	455	13.4	781
E-2	Upstream of CS-4	15.3	675	13.8	455	14.0	781
E-2	Pioneer Rd	-	-	13.9	454	14.3	771
E-2.5-2	Birdie Dr	-	-	15.6	14	16.5	11
E-2.5-2	Ace Dr	-	-	15.6	13	16.5	12
E-2.5-3	10th Ave N	-	-	14.7	2	15.5	3
E-2E	Confluence with the L-11	-	-	14.6	216	15.5	303
E-2E	NBTP from LakeWorth	-	-	14.7	169	15.6	241
E-2E	TP to LakeWorth	-	-	14.7	168	15.6	240
E-2E	Confluence with the L-12	16.5	80	14.7	168	15.7	240
E-2E	Confluence with the L-13 Canal	-	-	14.7	136	15.7	204
E-2E	Confluence with the L-14 Canal	16.2	108	14.7	111	15.7	186
E-2E	Confluence with the L-15 Canal	-	-	14.8	103	15.8	169
E-2E	Lantana Rd	-	-	14.8	49	15.8	91
E-2E	Confluence with the L-16 Canal	16.2	18	14.8	45	15.8	92
E-2E	North of CS-5	-	-	14.8	16	15.8	44
E-2E	Confluence with the E-2E Canal	16.3	318	14.1	278	14.7	444
E-2E	Northeast corner Forest Hill Blvd	16.3	318	14.2	226	14.9	352
E-2E	Confluence with the PSPC	-	-	14.4	247	15.2	368
E-2E	Confluence with the L-10	16.4	295	14.4	240	15.2	348
E-2W	Confluence with the L-11	-	-	14.4	56	15.4	90
E-2W	North of Lake Worth Rd	-	-	14.4	1	15.4	2
E-2W	Confluence with the E-2 Canal	-	-	14.0	448	14.6	766
E-2W	Confluence with the E-2W	16.3	169	14.2	152	14.9	275
E-2W	Confluence with the L-7 Canal	-	-	14.3	135	15.1	244
E-2W	Northwest corner Forest Hill Blvd	16.3	156	14.3	108	15.2	185
E-2W	Confluence with the L-10	16.4	131	14.4	89	15.4	159
E-3	Downstream of CS-6	-	-	11.9	421	13.1	564
E-3	Upstream of CS-6	14.4	813	13.8	421	14.0	564
E-3	Gun Club Rd	-	-	14.3	420	14.9	562
E-3	Confluence with the L-5 Canal	-	-	14.9	418	15.6	558
E-3	North of Forest Hill Blvd	-	-	15.9	246	16.7	265
E-3	South of Forest Hill Blvd	15.9	479	15.9	241	16.7	256
E-3	Purdy Ln	-	-	16.0	207	16.7	241
E-3	Cresthaven Blvd	-	-	16.0	79	16.8	100
E-3	10th Ave N	-	-	16.1	66	16.8	96
E-3	Confluene with the L-11	-	-	16.1	115	16.8	145

MOCK•ROOS pg. 55

GIS Integration

[Link to LWDD GIS]

2025 – SWMS Design Storm Report

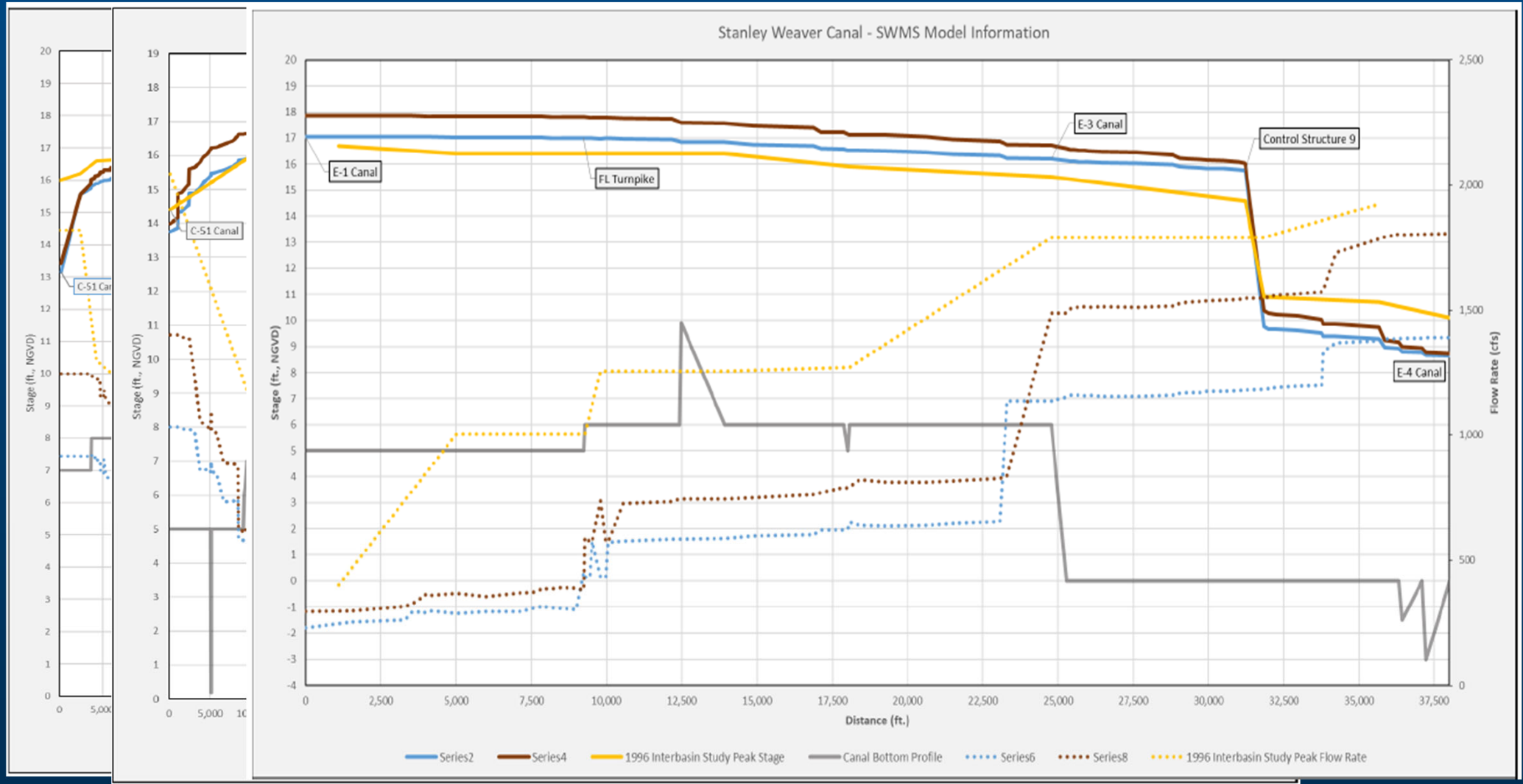
- FINAL PHASE - Design Storm Report
  - Updates 1996 Interbasin Study

- In general, when compared to the 1996 report, the current model estimated
  - Lower Peak Flow Rates
  - Slightly Higher Peak Stages in Equalizers
  - Comparable to Lower Peak Stages in the Laterals.

- The 16 basin is running a little higher than the 1996 study, with a few points being appreciably (>0.5ft) higher. Most notably the C. Stanley Weaver with higher stages, with significantly lower flows.
- The Boca Basins, including the north and coastal are slightly below the 1996 report.
- The E-1W varies; however, stages are similar from the 1996 report.
- The Eastern Basin varies with comparable stages, and in a few instances comparable or higher flows, but lower peak stages and flows in the laterals.
- The 13 basin (aka Lake Worth Basin) is illustrating lower stages with comparable or higher flow rates in the equalizers but lower peak stages and peak flow rates in the laterals.
- The remaining basins, including the north basin and the systems west of SR7, illustrate similar differences with lower stages and flow rates when compared to the 1996 study.

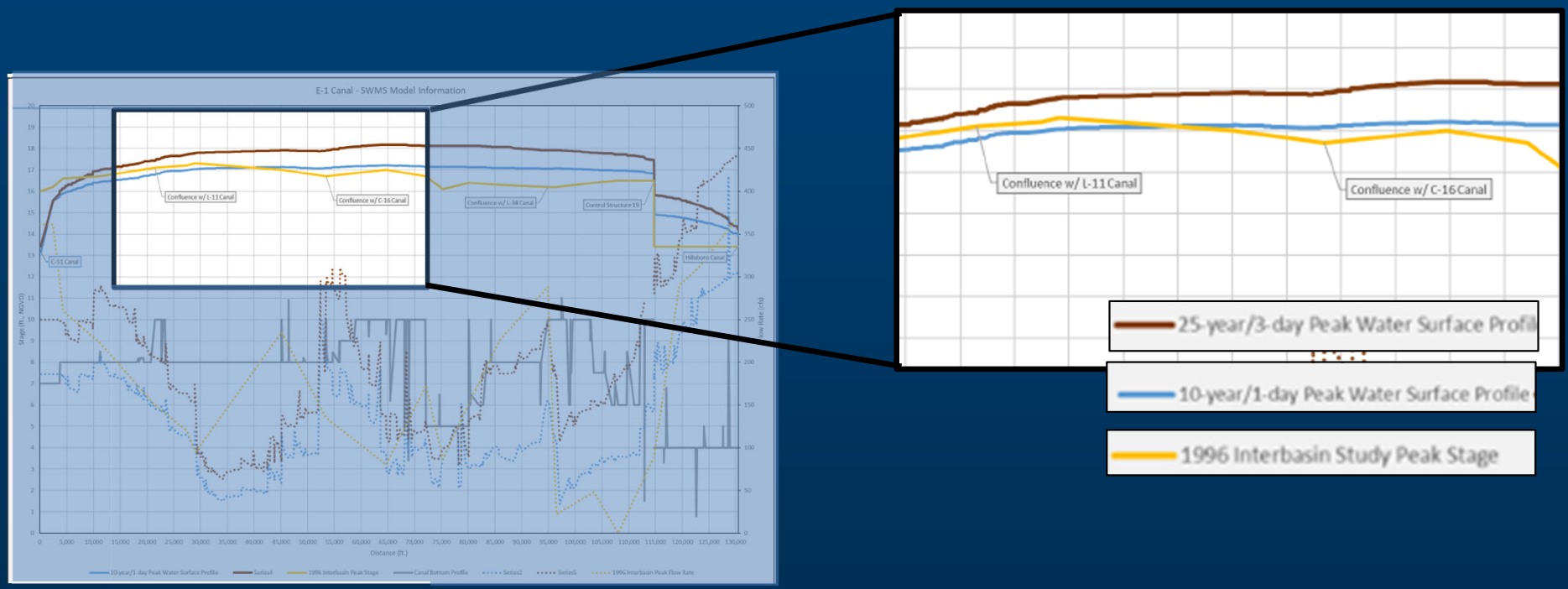
2025 – SWMS Design Storm Report

- FINAL PHASE - Design Storm Report
  - Updates 1996 Interbasin Study



Future Efforts - Permitting & Review

- Review in detail the model results in comparison to prior models
- Determine what, if any, revisions to our permitting guidelines may be warranted



Future Efforts – Detailed Reviews and Analysis

- The impact of potential development west of SR 7
- The potential impact of installation of retaining walls along the E-2W and other impacts of the FL Turnpike expansion
- Evaluate the model in context with SFWMD's Flood Protection Level of Service (FPLOS) Assessment

Future Efforts – Detailed Reviews and Analysis

- Review long range structure and/or operational changes to improve system responsiveness
- Further integration of secondary structures
- Review potential impact of potential modifications to SFWMD structure and operational changes

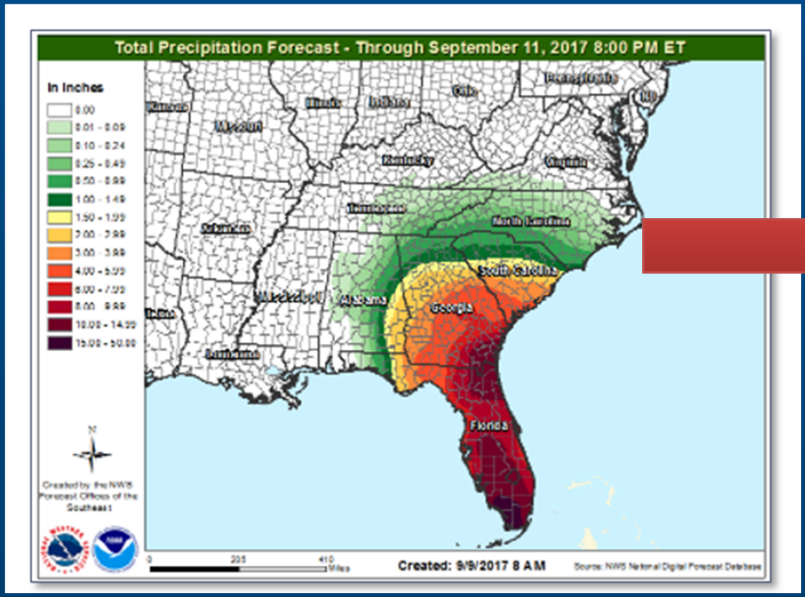
Future Efforts – Model Maintenance

- System updates and modifications (inc. Permits)
  - Minor resulting from permits
  - Major changes or studies
  - Re-calibration and refinement
- Periodic Revisions and Publications
  - Frequency shall be determined by need

Future Efforts – Groundwater and Drought Mitigation

- Consider Future Expansion of the model to include groundwater component
  - While groundwater is of course a consideration, an expansion to include groundwater details would be beneficial to drought analysis
  - Lower East Coast Regional Ground Water Model

Future Efforts - Forecast Model

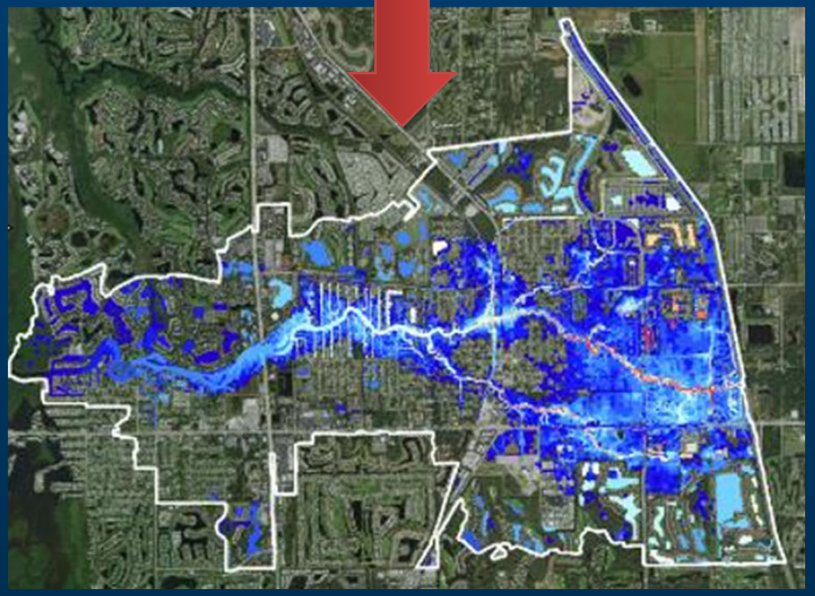


Near Real Time
updated every hour

Short Range Forecast
18-hour forecast updated every hour

Medium Range Forecast
10-day forecast updated every 6 hours

Model links directly to National Weather Service to obtain forecasts and corrects for antecedent conditions and rain accumulation



Questions & Discussions

Budget & Schedule

- Work Initiated February 2021
- Initial Completion Date, Dec 2024
  - Final Completion September 2025. **9 Months Behind**
- Initial Budget $725,000
  - Final Sum of all services, including Engineering, Surveying $732,231. **$7,231 Over** (<1%)

Request to Extend General Engineering Contract with Mock Roos (20-9854L.06)

October 7, 2025
Agenda Item #4
Anthony LasCasas, Director of Operations and Maintenance

LAKE WORTH DRAINAGE DISTRICT

1

Contact Timeline History

- July 2019 – Board approval to solicit bids
- June 28 & July 5, 2020 – Advertise Request for Qualifications
- July 30, 2020 – Submittals Required
- August 27, 2020 – Oral Presentations by Responsive Firms
- September 1, 2020 – Review Committee meeting
- September 16, 2020 – Board Consideration of Ranked Firms
- October 14, 2020 – Award of Contract
- Active Contact from October 2020 – October 2025

2

Rates

- All terms, conditions and exhibits set forth in the original contract No. 20-9854L.04 remain part of this contract:
  - General terms and conditions
  - Scope of Servies
  - Insurance requirements
- Rates have increased as follows:

Oct 2020 - Oct 2025		Oct 2025 - Oct 2030	
Position Title	Hourly Billing Rate	Position Title	Hourly Billing Rate
Engineering Assistant	$60.00	Engineering Assistant	$95.00
Engineering Technician	$110.00	Engineering Technician	$105.00
Engineer	$135.00	Engineer/Engineering Intern	$140.00
Lead Engineer	$165.00	Professional Engineer	$195.00
Chief Consulting Engineer	$175.00	Lead Professional Engineer	$250.00
Principal Engineer	$195.00	Chief Professional Engineer	$295.00
		Principal Professional	$330.00

3

Staff Recommendation

- Approve Contract extension for General Engineering Services with Mock Roos & Associates for a term of (3) three years with two one (1) year renewal options for a maximum of 5 years

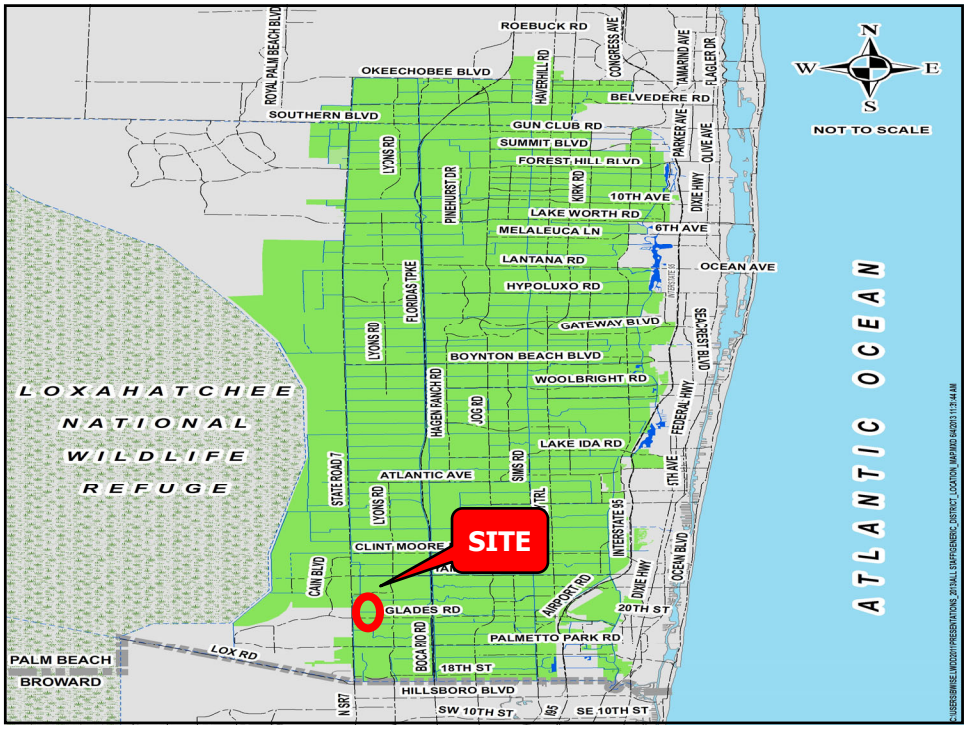
4

SBA Communications Corporation Temporary Cell Towers within the L-46 Canal Right-of-Way; East of SR-7 (441)

Project #RW-25-0240

Nicole Smith, Permit Supervisor
Board Meeting – October
Agenda Item #4

1



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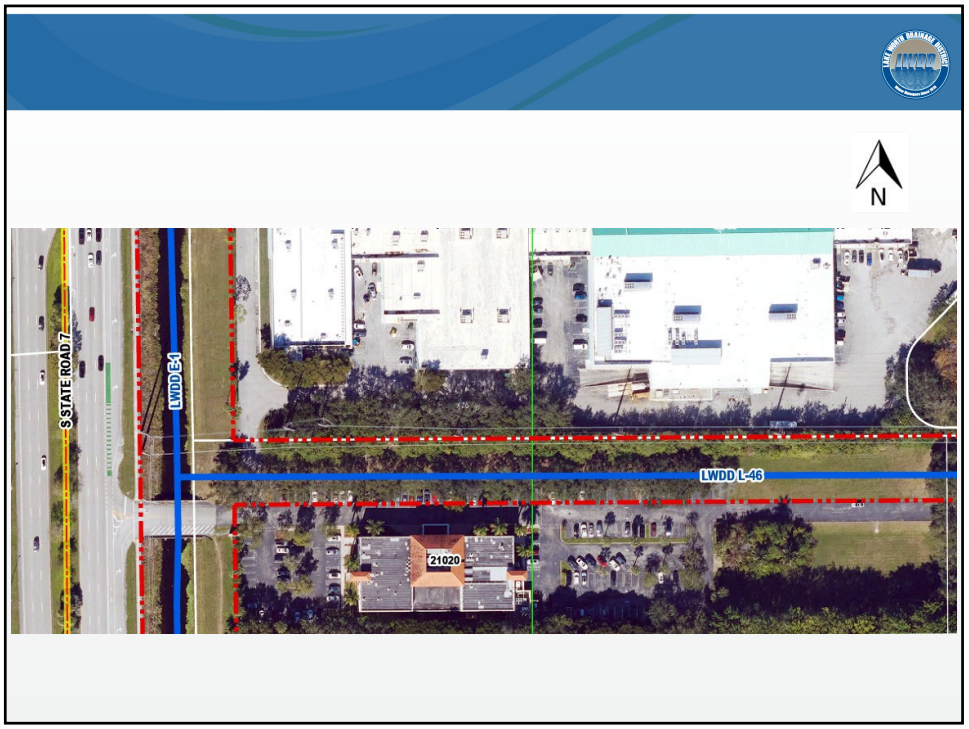
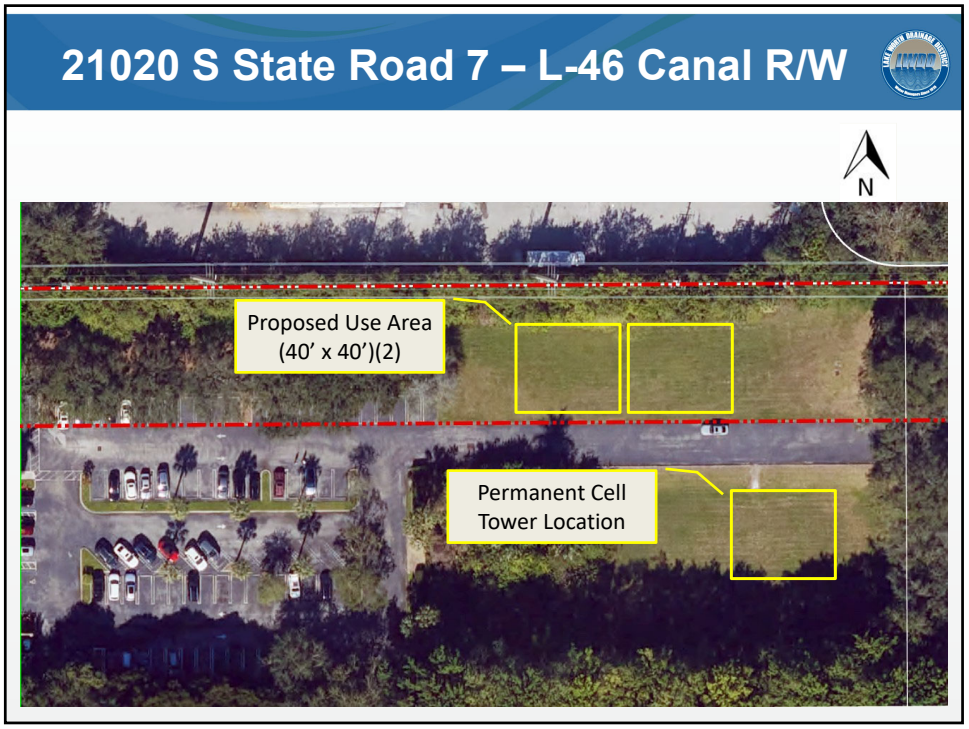
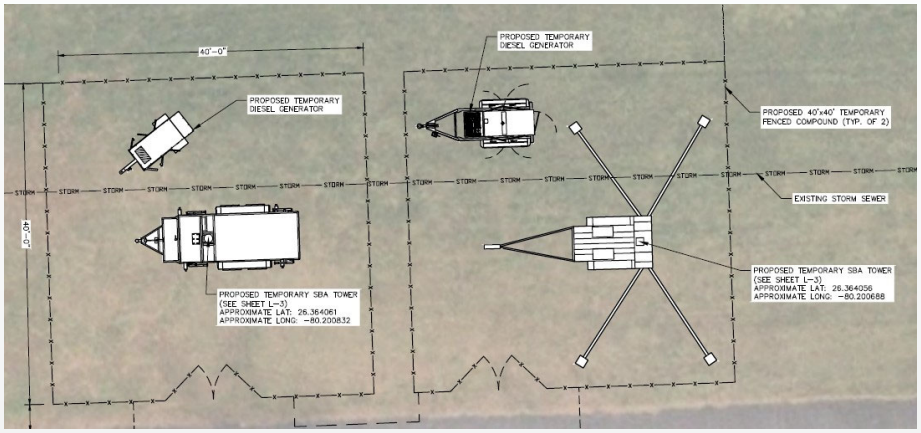

N
S STATE ROAD 7
LWDD E-1
LWDD L-46
21020

3


21020 S State Road 7 – L-46 Canal R/W
N
Proposed Use Area
(40’ x 40’)(2)
Permanent Cell
Tower Location

4

L-46 Canal Right-of-Way



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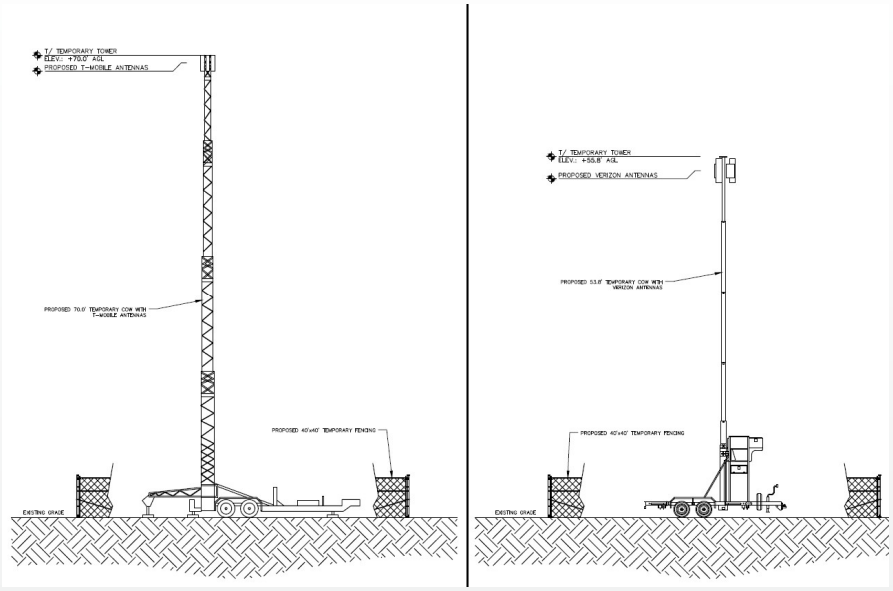
Temporary Cell Towers



6

L-46 Canal Right-of-Way

- LWDD has an 80' exclusive easement for the L-46 Canal
- December 17, 1987 – LWDD issued a QCD to H.A.S. Land Development, Inc. for the L-46 Canal Right-of-Way (ORB5516/1948)
- December 17, 1987 – LWDD received an exclusive easement deed from H.A.S. Land Development, Inc. for the L-46 Canal Right-of-Way (ORB5516/1950)
- December 6, 2013 – Assumption of Piping, Paving, and Parking License Agreement with West Imp, LLC. (ORB26488/1294)
- July 2, 2025 – Initial meeting with applicant
- August 21, 2025 – Follow-up meeting with applicant
- September 29, 2025 – Applicant submitted right-of-way permit application

7

Initial Request

- Applicant initially requested the installation of a permanent cell tower within LWDD's L-46 Canal Right-of-Way

8

Modified Request

- Applicant modified their request for the use of the L-46 Canal Right-of-Way for the placement of two (2) temporary cell towers during the relocation of their existing cell tower from Shadowood Plaza to the new location for ~2 – 3 years
- Applicant is in the permitting process with PBC for the new permanent location
- Cell Tower is a necessity for cell service in the west boca area

9

Staff Recommendation

- Approval to issue a Right-of-Way Permit for the temporary installation of two (2) cell towers within the L-46 Canal Right-of-Way during the relocation of the existing cell tower for ~2-3 years:
- Subject to:
  - Cell Tower Permit Fees:
    - Application Fee: $500.00
    - Use Fee: $17,000.00 ($5.00 PSF x 3,400 sq. ft.)
  - Utility Permit Fees:
    - Application Fee: $1,700.00 (850’ x $2.00)
    - Use Fee: $17,000.00 (850’ x $20.00)
  - Proof of Liability Insurance listing LWDD as additional insured
  - Written acknowledgement from underlying fee owner
  - Pipe Inspection
  - Annual Fees:
    - 1st and 2nd Years of use applicant will pay LWDD $10,000.00
    - 3rd Year of use applicant will pay LWDD $25,000.00
    - 4th Year of use applicant will pay LWDD $50,000.00 and each year thereafter the fee will double until the Temporary Cell Towers and Facilities are removed entirely from the L-46 Canal Right-of-Way

10

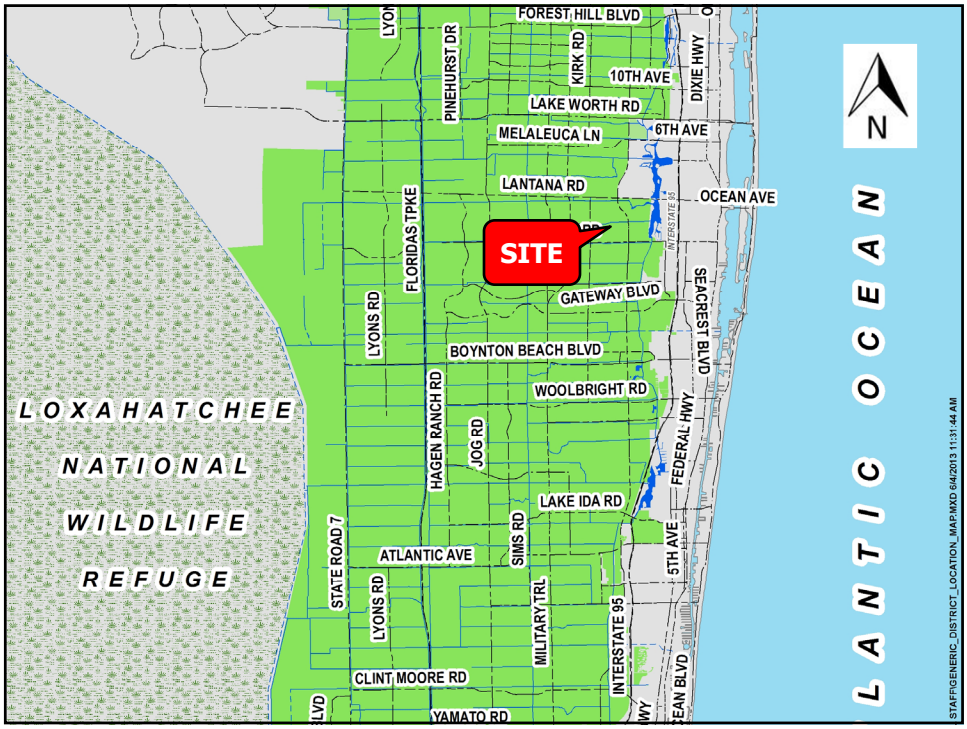
Approval to Surplus and Sell Chancery Case 407 Interest Within Lot 8, and West 12 feet Lot 7, Block 21, Hypoluxo Village (Unrecorded)

DRAFT—Workshop

RI-25-0046

Dave Bends
Right-of-Way Interest Supervisor
October 7, 2025
Agenda Item #4

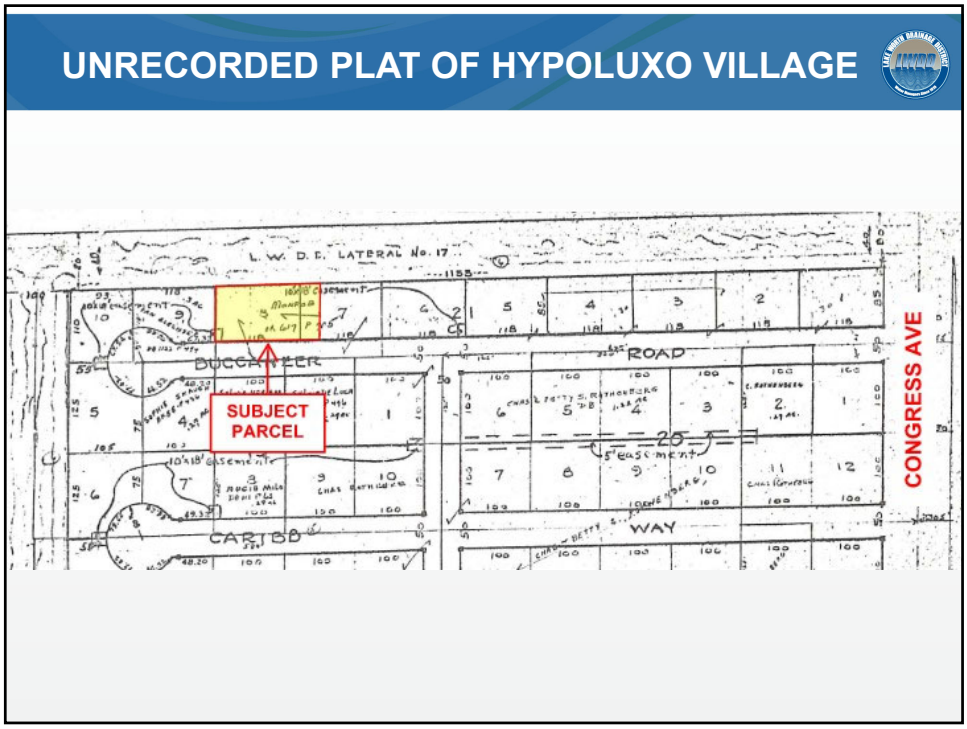
1



2


LWDD L-15
S MILITARY TRL
LWDD E-3
1/2-6
LANTANA RD
LWDD L-16
S CONGRESS AVE
LAWRENCE RD
LWDD L-17
SITE
LWDD E-4
HYPOLUXO RD
LWDD L-18

3


UNRECORDED PLAT OF HYPOLUXO VILLAGE
L. W. D. D. LATERAL No. 17
SUBJECT PARCEL
ROAD
CONGRESS AVE
WAY

4

BACKGROUND

- June 2025
  - The Fund Title Company submitted a Chancery review request for the subject property.
  - LWDD responded, stating that LWDD owns the north +/- 27 feet of the subject property per Chancery Case 407, and provided the property owner with an option to purchase
  - Richard “Chip” Carlson, Esq., is here today representing the property owners, Deborah and Stanley Roth

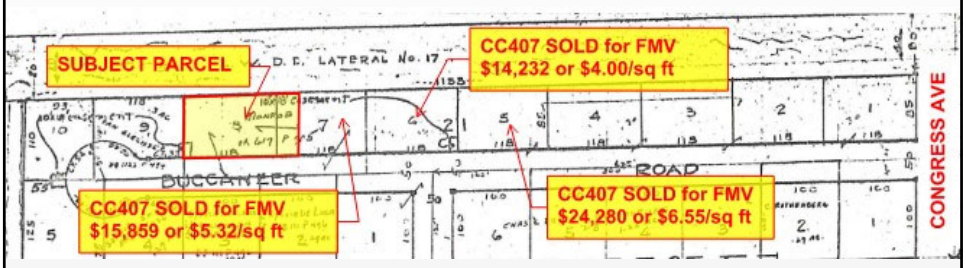
5

BACKGROUND

- LWDD has previously sold its Chancery Case 407 interest in 3 lots within Block 21, Hypoluxo Village (unrecorded plat)
  - 2004-Lot 5
    - Sold at Fair Market Value- $24,280 ($6.55/sq ft x 3707 sq ft)
  - 2009-Lot 6
    - Sold at Fair Market Value- $14,232 ($4.00/sq ft x 3558 sq ft)
  - 2015-Lot 7
    - Sold at Fair Market Value- $15,858.92 ($5.32/sq ft x 2981 sq ft)

6

PREVIOUS SALES OF CHANCERY R/W



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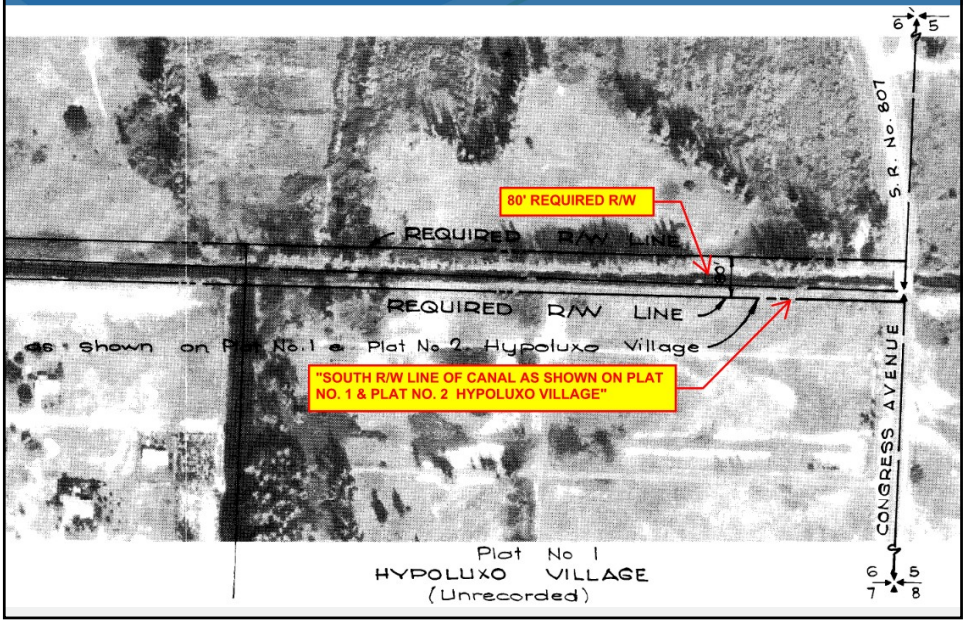
1968 REQUIRED R/W MAP



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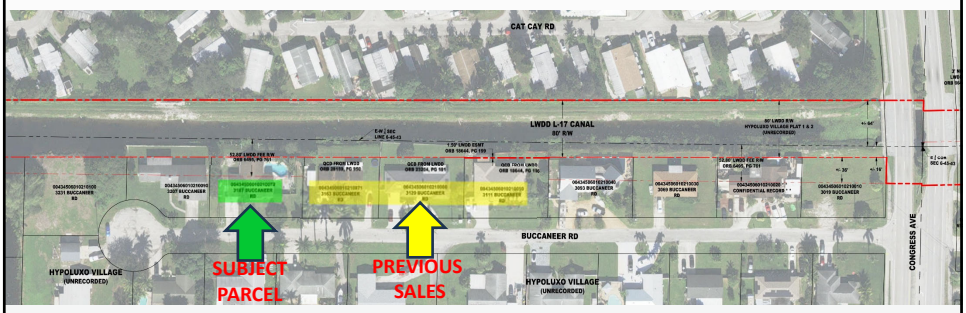
Current R/W Map



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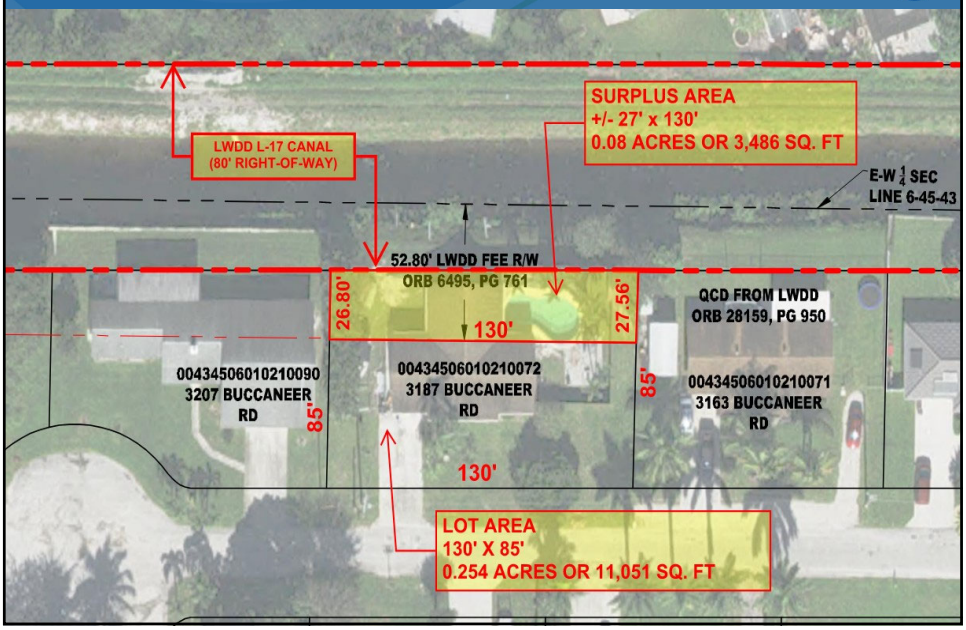
Surplus Area



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**Property Appraiser Land Values

Option 1

- 2024 – Current Tax Year
  - **Land Value - $277,100 or $25.08 per sq. ft.
  - Surplus area 3,486 sq. ft. x $25.08 = $87,429 purchase amount

Option 2

- 1999 – Roth Purchase Year
  - **Land Value - $30,000 or $2.72 per sq. ft.
  - Surplus area 3,486 sq. ft. x $2.72 = $9,482 purchase amount

Option 3

- 1974 – House Construction Year, or the last publicly available Property Appraiser's Land Value Record (1977 in this case)
  - **Land Value - $2,360 or $0.18 per sq. ft.
  - Surplus area 3,486 sq. ft. x **$0.18 = 633.82 purchase amount

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