Thousand Oaks / Trinity Oaks Problem Solving Task Force

October 27, 2014

Agenda

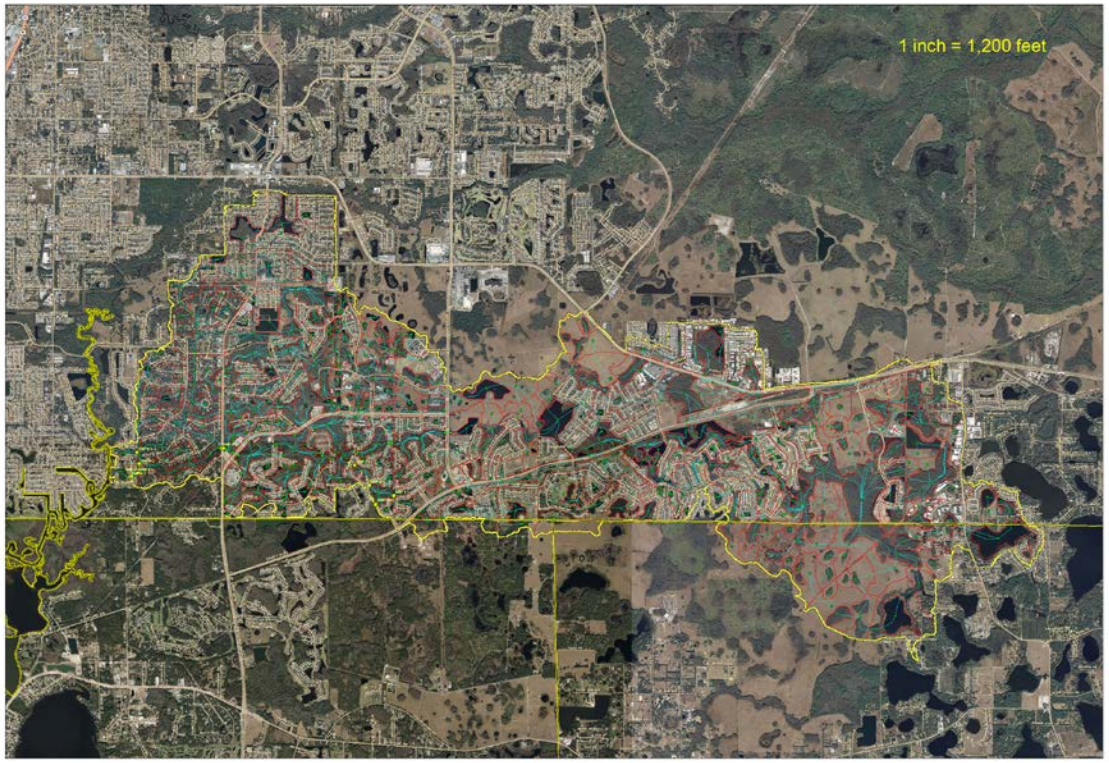
* Welcome
* Background & Summary of Activities
* Construction Update:
  * BMP 1A, 5A and Mitigation Area
* BMP 6
* Operation of Gates
* Pumping Operations
* Rain Gauges & Monitoring
* Neighborhood Weather Watchers Program
* PACE
* Next Meeting

Background & Summary of Activities

* **Stormwater Management**

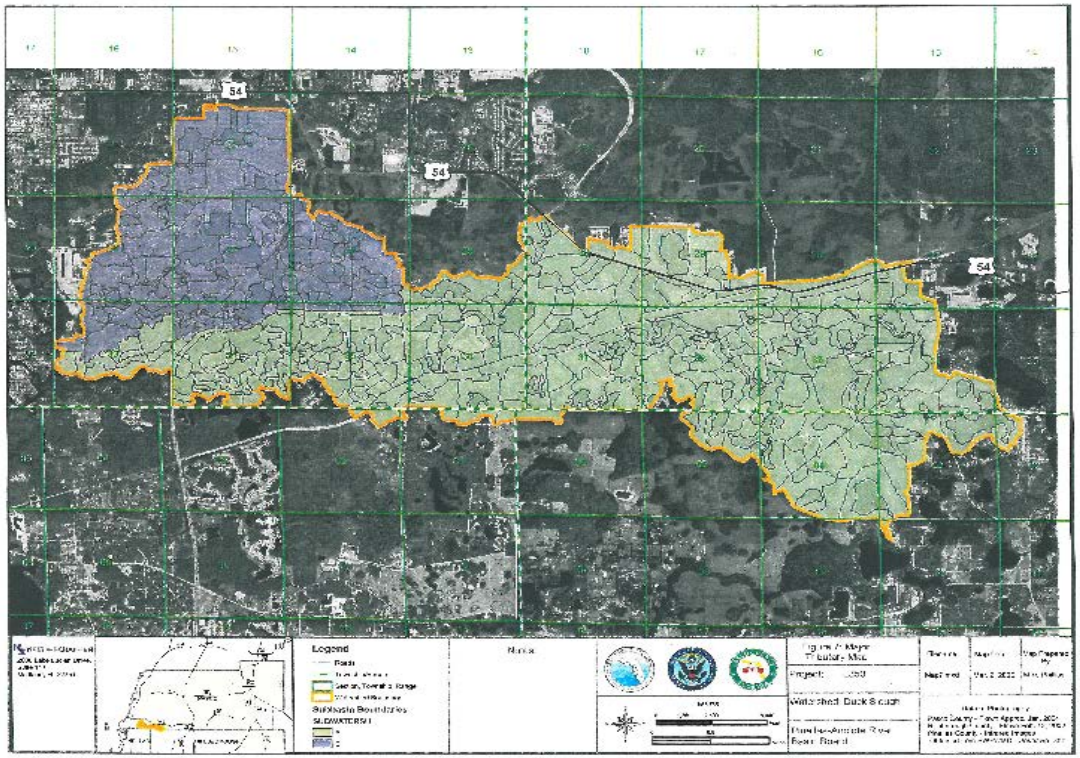
DUCK SLOUGH WATERSHED

* **Watershed is 14.1 sq miles**



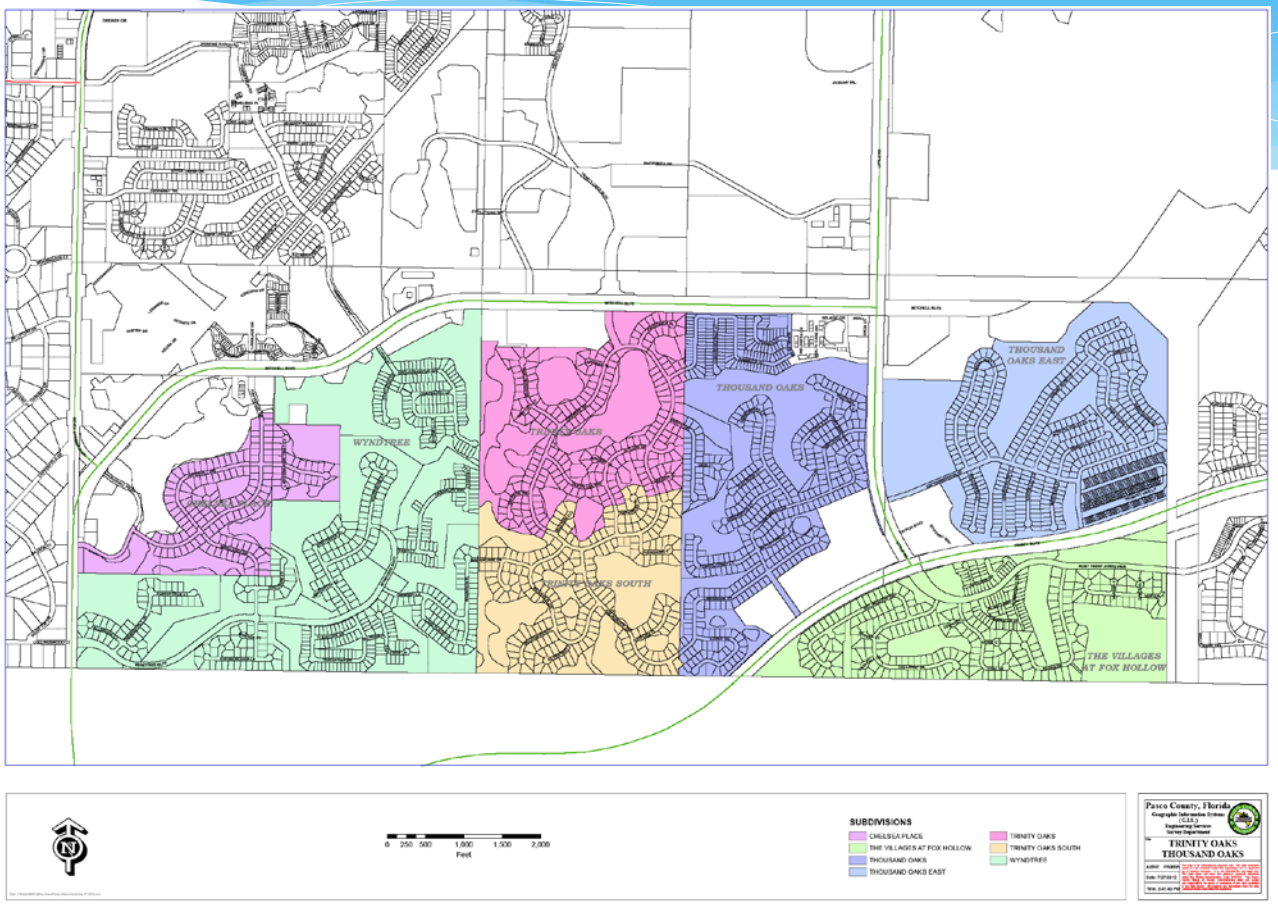
DUCK SLOUGH WATERSHED

* 10.1 sq Miles Flows Through Affected Developments



DUCK SLOUGH FLOW

DEVELOPMENTS INVOLVED



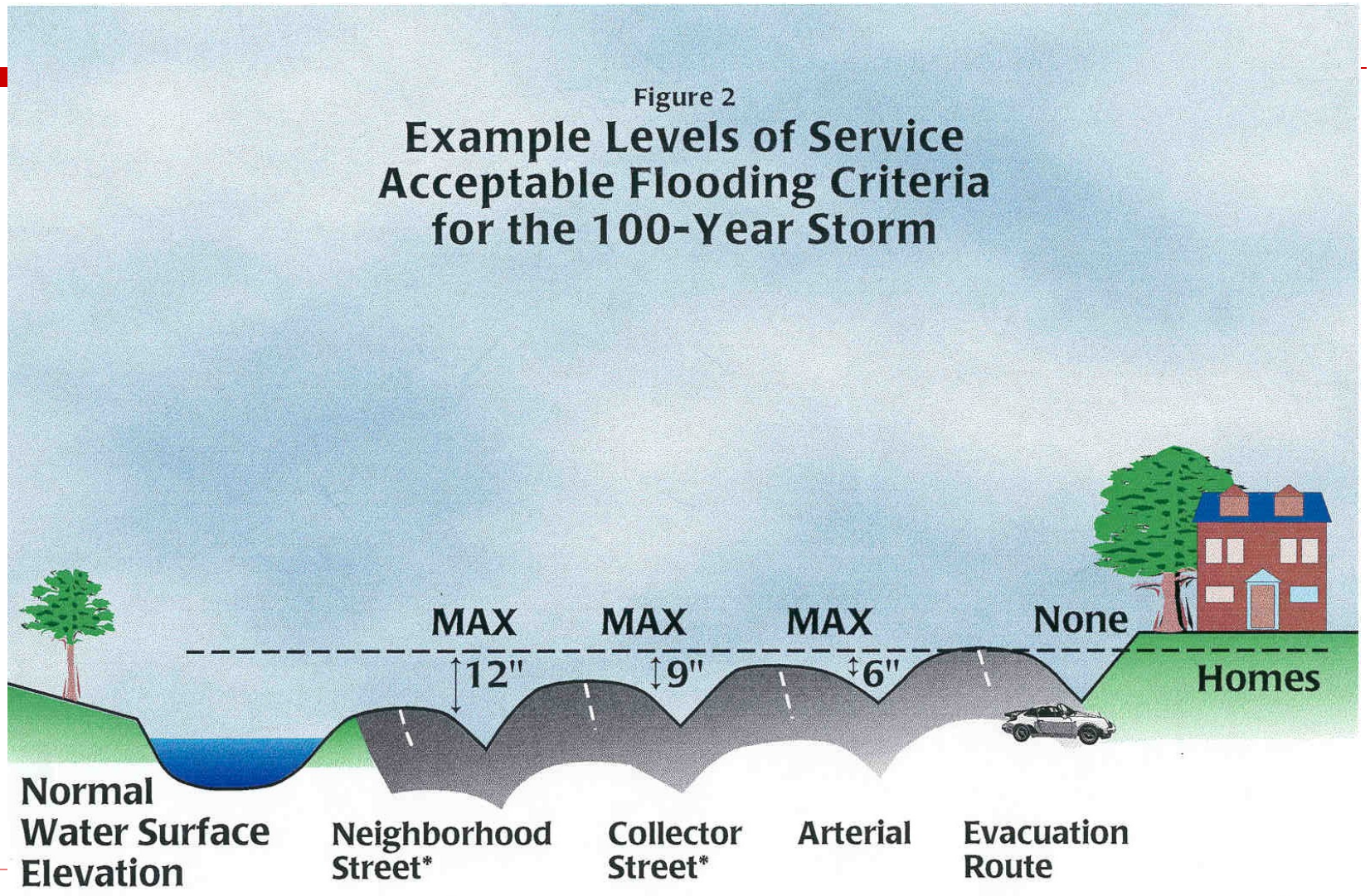
History

* Trinity was permitted in the late 1980s under the MSSW rules that charged an engineer with doing no harm
* Wyndtree and Chelsea Place were also permitted in the late 1980s.
* Thousand Oaks is the newest and was permitted in 1994 under the same rules

Development Standards

Level of Service

(evaluate the potential for flooding of infrastructure and buildings)



* Neighborhood and collector streets should be passable for the 10 and 25-year storm flood, respectively.

Developments were built and then the Rains Came……..

2002 Trinity Oaks

2002 Trinity Oaks

Kinsmere

2003 Trinity Oaks

2004 Flooding from Hurricane Francis

Kinsmere

2004 Flooding from Hurricane Francis

Kinsmere

2003/2004 Flooding

- Roads flooded for an extended period of time
- Extensive road damage
- Roads were repaired using a Federal Disaster Declaration Public Assistance Grant.

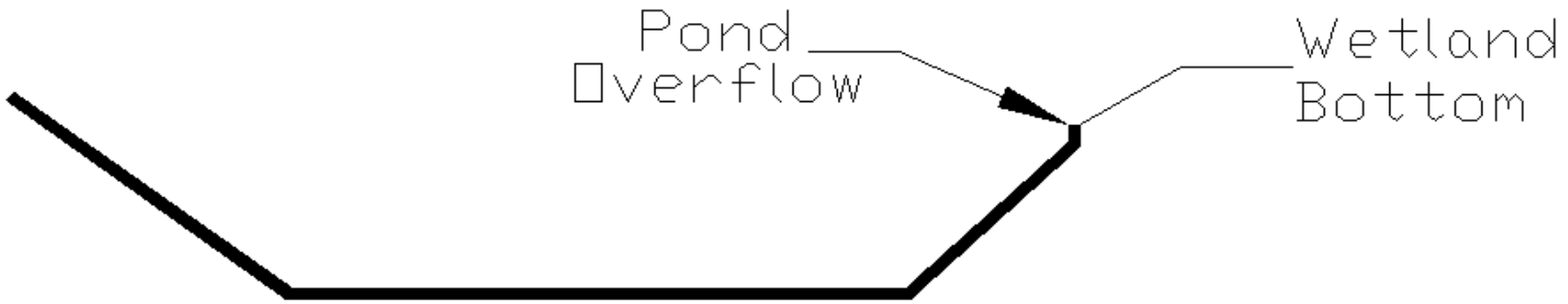
2005 Study

- As a result of the flooding the county hired an engineering firm to study the problem and recommend solutions
- This was funded by the County and the SWFWMD on a 50/50 basis and cost $500,000

2005 Study

- While the engineering study recognized that the ponds did not drain because the wetlands were higher than the ponds it recommended operable structures for flood control as the only permittable option

Wetland Higher Than Pond Discharge



2007/2008 Design/ Permitting

- A firm was selected and completed the design/permitting at a cost of $360,000

- This was funded 25%County, 25% SWFMD and 50% State grant.

2008

Stormy Weather Moves Across Region By NEIL JOHNSON |

The Tampa Tribune Published: July 13, 2008

- TAMPA - Thunderstorms drifted slowly onshore from the Gulf of Mexico late Saturday and early this morning, flooding streets in west Pasco and forcing organizers to cancel an early morning triathlon.
- Flooding forced two families from their mobile homes in New Port Richey and the American Red Cross opened a shelter overnight for the six people.
- Three men and three women, from 19 to 56 years old, will be put up in hotels for the next several days.
- Rain dumped up to 4 inches of water into their homes in a mobile home community on Aurora Drive.
- The Red Cross will keep equipment ad supplies at the shelter the agency opened at the St. Mark's Presbyterian Church in Hudson in case the rains force more families from their homes, said Abi Weaver, spokeswoman.
- The storms edged from the Gulf over the coast of Pasco County about 11:30 p.m., Saturday and continued for several hours.
- The flooding stranded cars and left water standing nine inches or higher in streets of Bayonet Point, New Port Richey and Hudson.
- The National Weather Service reported 2.3 inches of rain was measured in New Port Richey in 30 minutes and 3.3 inches was measured in Hudson in an hour.
- A spotter measured 4 inches of rain in Clearwater in 90 minutes.
- The worst of the Pasco County flooding was centered near State Road 54 and Seven Springs Boulevard. Vehicles were stranded near U.S. 19 south of New Port Richey, the weather service said.
- The rain headed south toward Pinellas and forced the cancellation of the Morton Plant Mease Triathlon that was to start at 6:50 a.m. at Sand Key.
- Rain covered all of Pinellas, western Pasco and north and western Hillsborough, the weather service.
- Residents can expect a lull through part of the morning, but the weather service said chances for rain will shift to interior areas and south of the Nature Coast during the afternoon.

2010 Construction-Operable Structures

At end of Millstone Drive

Seven Springs Boulevard

Kinsmere Drive

2011

- The structures were funded 25%County, 25% SWFWMD and 50% State grant at a cost of about $1,000,000.

- With flood control structures in place the County began the long process of obtaining approval to improve a channel through the wetlands to assist the ponds in working the way they were designed to work

2010/2011

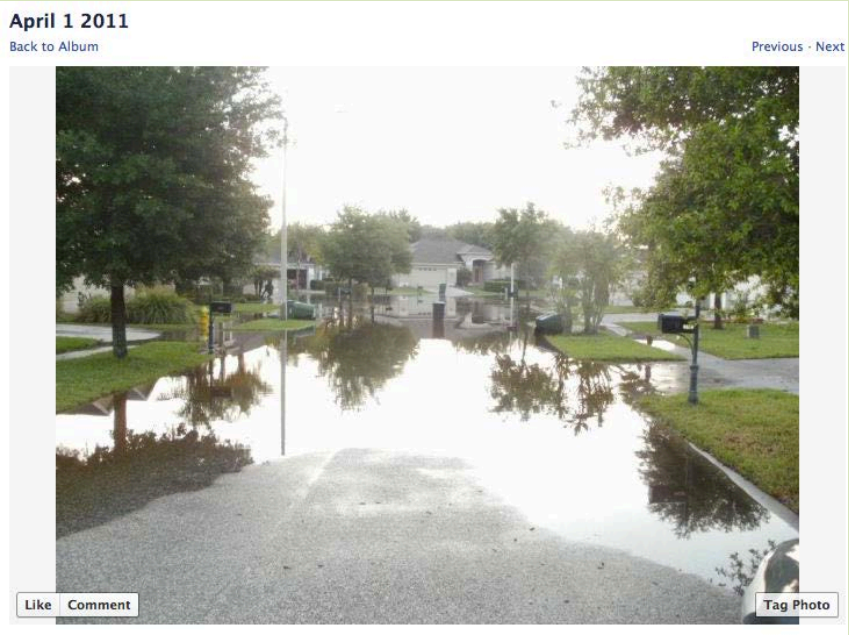
* We felt that we had found evidence that dredging had occurred at some time in the wetlands.

SPOIL PILE

2011

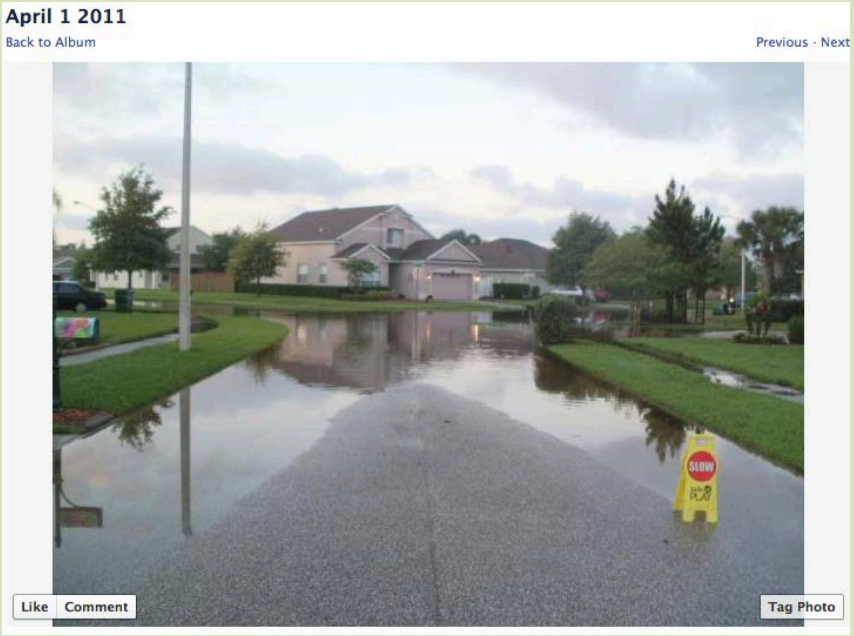
* We prepared plans to re-establish what we felt was a pre-existing canal in the wetlands and applied for a maintenance exemption but it was not able to be granted and the ACOE rules do not allow for a maintenance exemption
* We then began the longer process of permitting a drainage improvement through the wetlands

April 1st 2011 Flooding



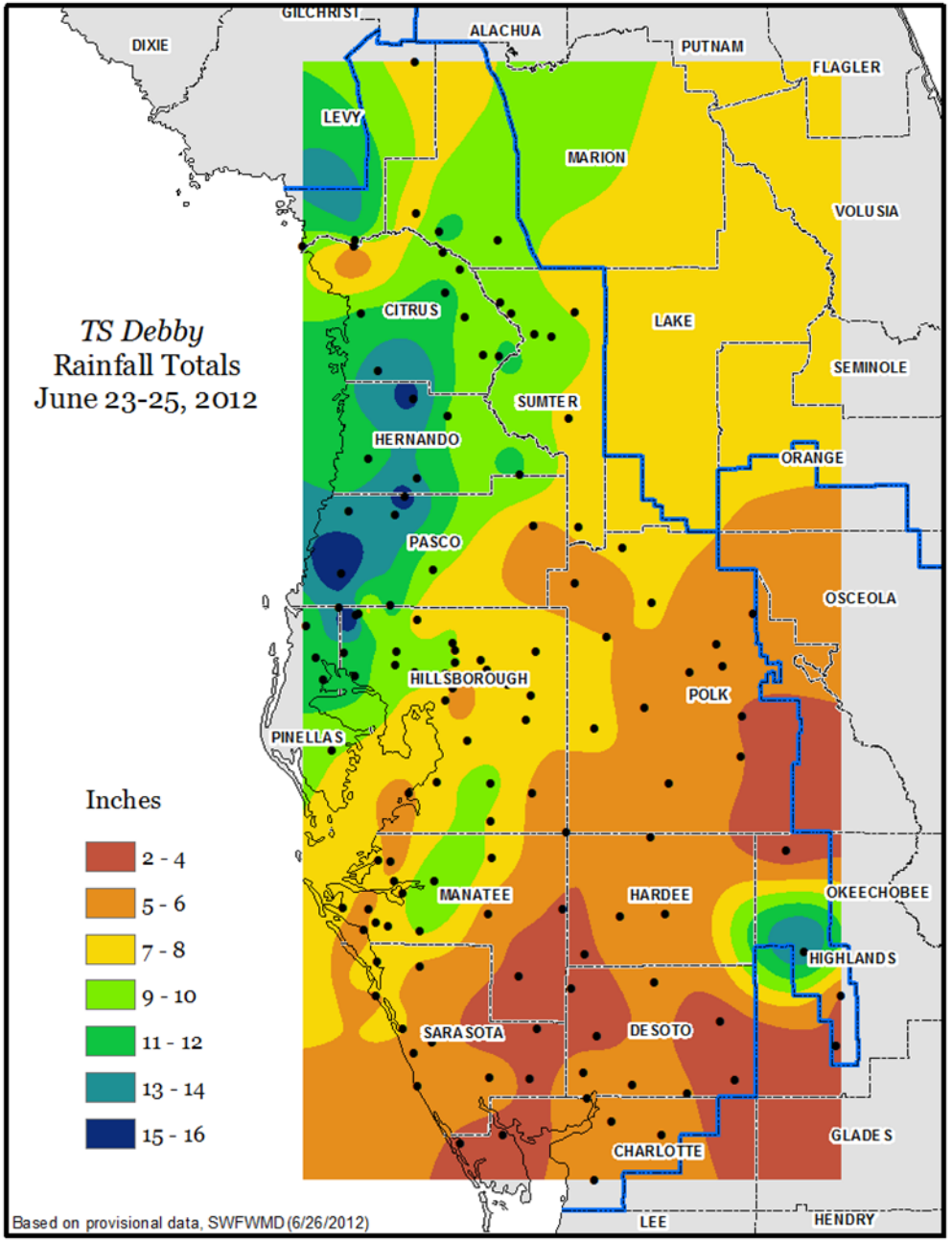
Wavyedge Ct.

April 1st 2011 Flooding



Short Birch Ln.

2012 Tropical Storm Debby



June 2012 TS Debby
Trapped or Flooded for 4 days

Wavyedge Ct.

June 2012 TS Debby
Trapped or Flooded for 4 days

Wavyedge Ct

June 2012 TS Debby
Trapped or Flooded for 4 days

Wavyedge Ct

2012 TS Debby Trinity Oaks

Kinsmere

2012 TS Debby Thousand Oaks Multi-Family

Wall at end of Persea Ct

2012 TS Debby Thousand Oaks Multi-Family

Persea & Mahaleb

2012 TS Debby Thousand Oaks Multi-Family

Mahaleb Drive

Persea Court

June 2012 TS Debby Trapped or Flooded for 4 Days

Kish & Torchwood

LITTLE ROAD


TRINITY

Back to Back Rains

July 2012 Big Storm Trapped for 3 Days

Wavyedge Ct.

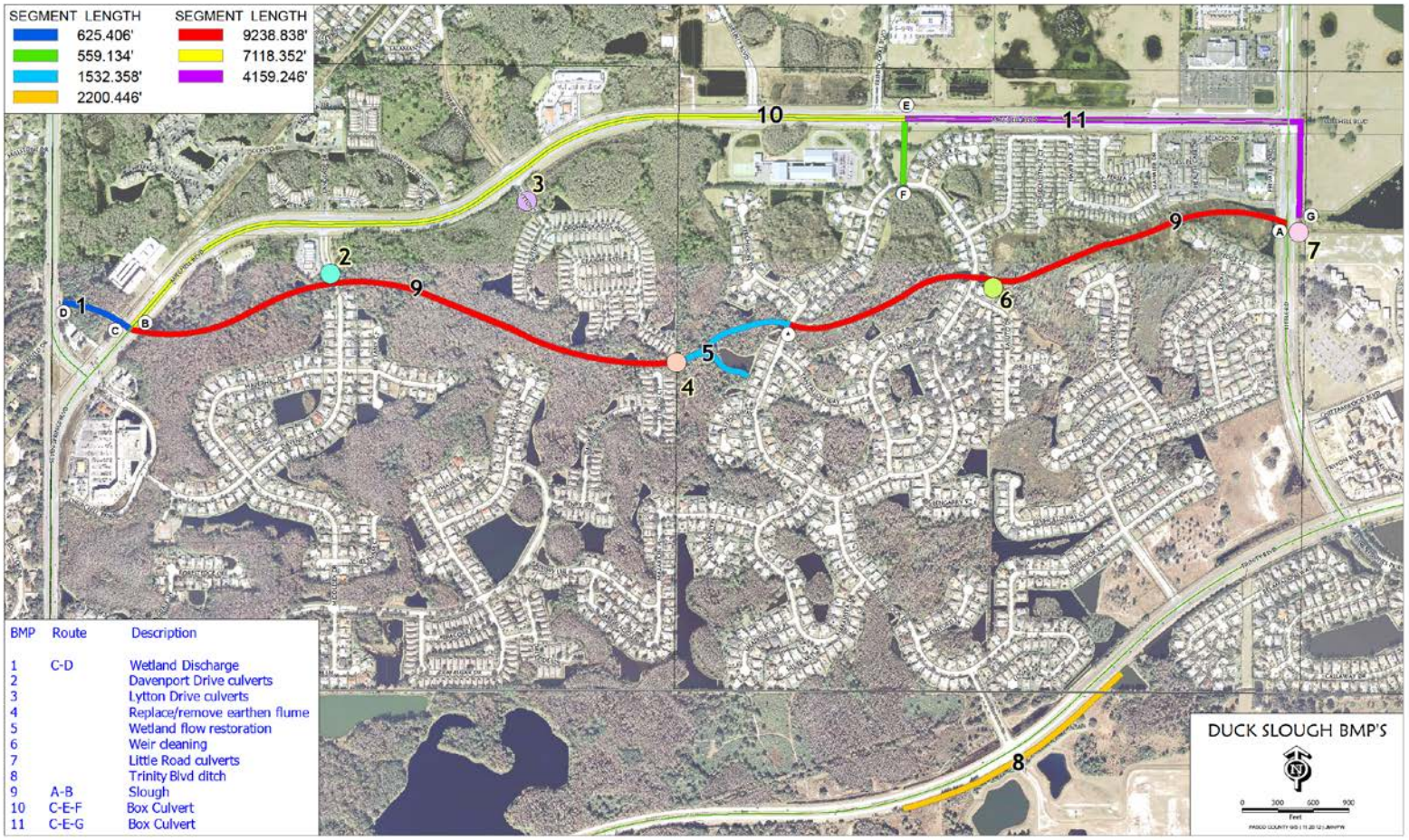
July 2012 Big Storm Trapped for 3 Days

East End of Wavyedge Ct.

Problem Solving Task Force

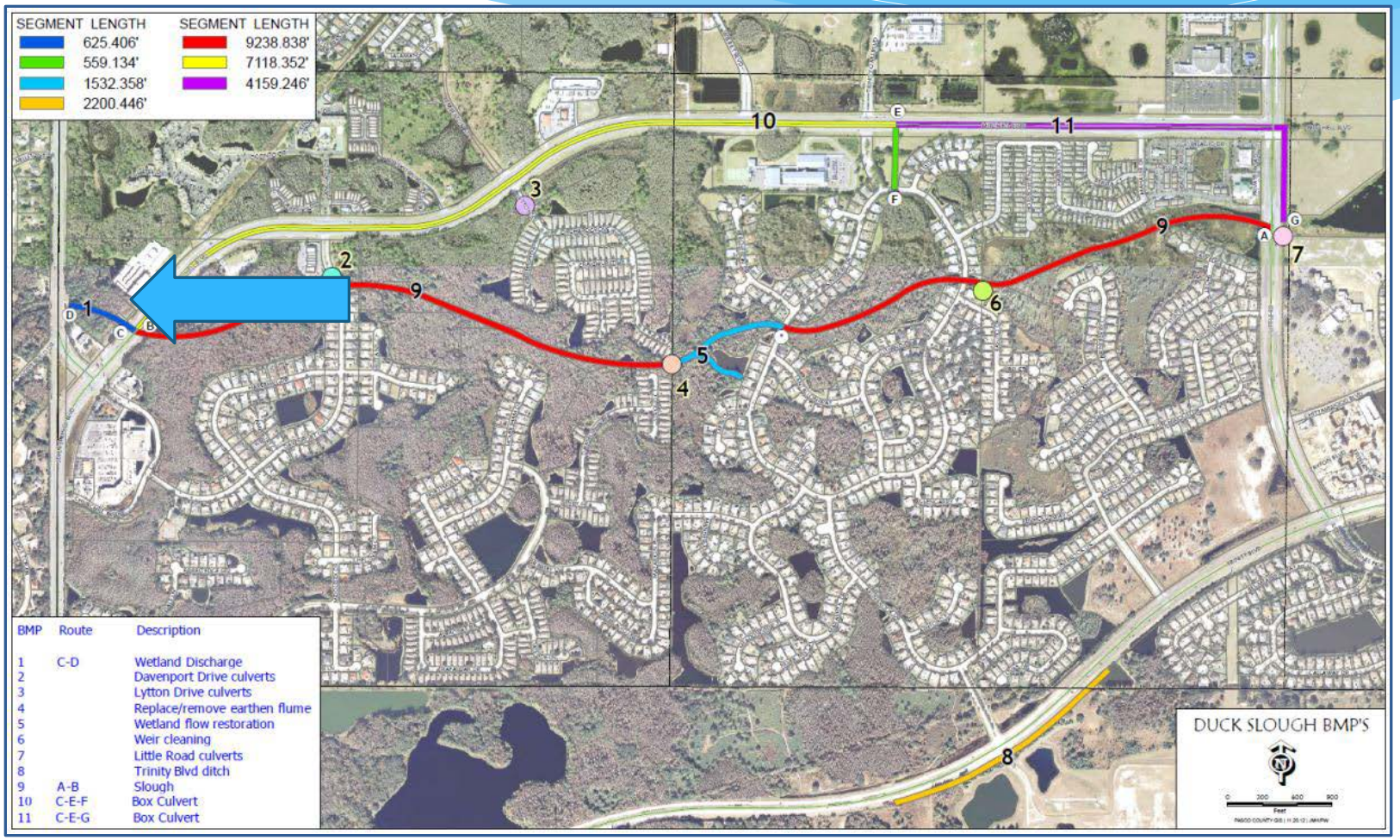
* **Began meeting biweekly beginning August 13, 2012**

Conceptual BMPs

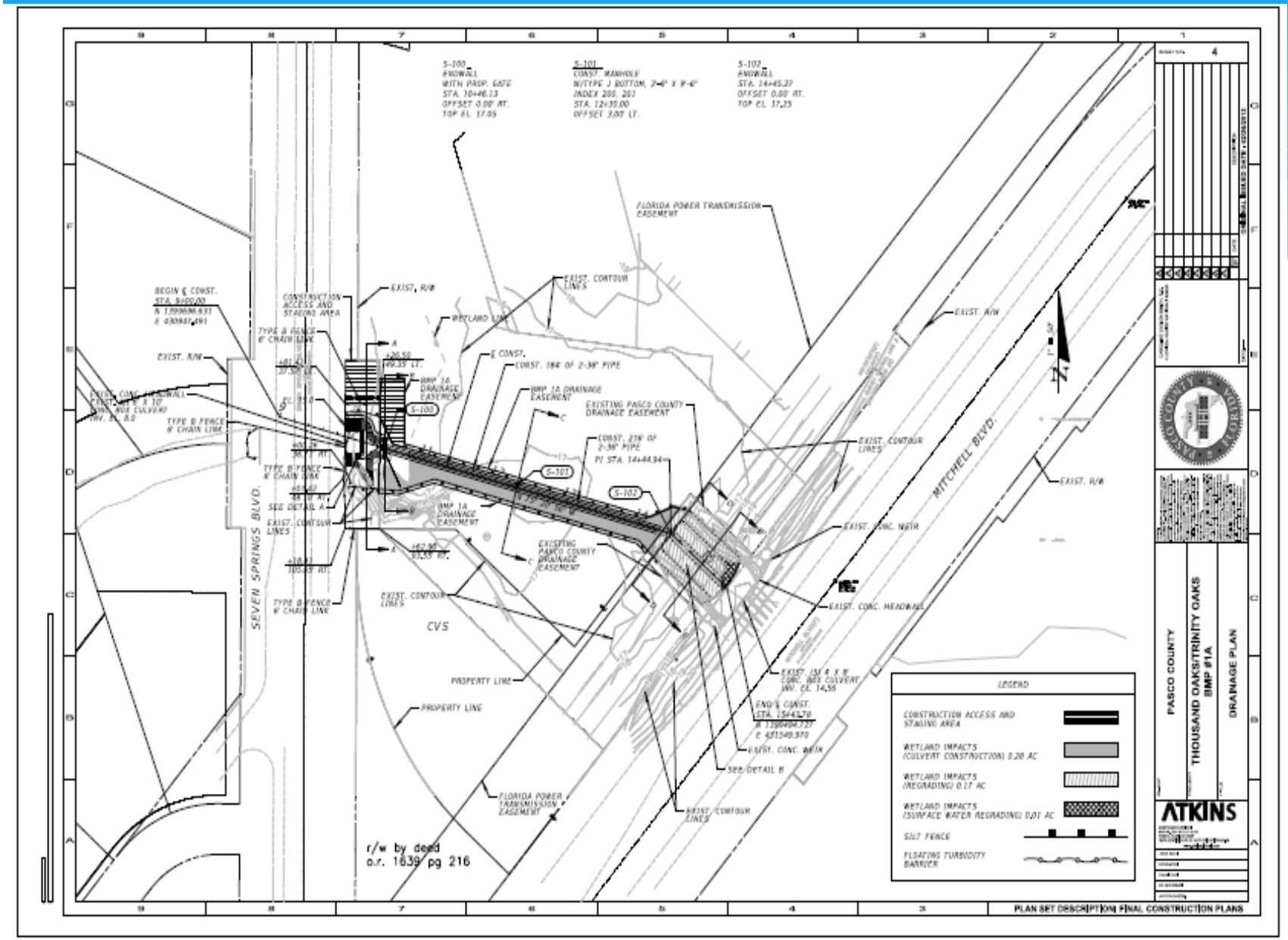


* **Which alternatives did we evaluate…**

BMP 1-Channelized Segment



BMP#1A-2 Culverts with Gate

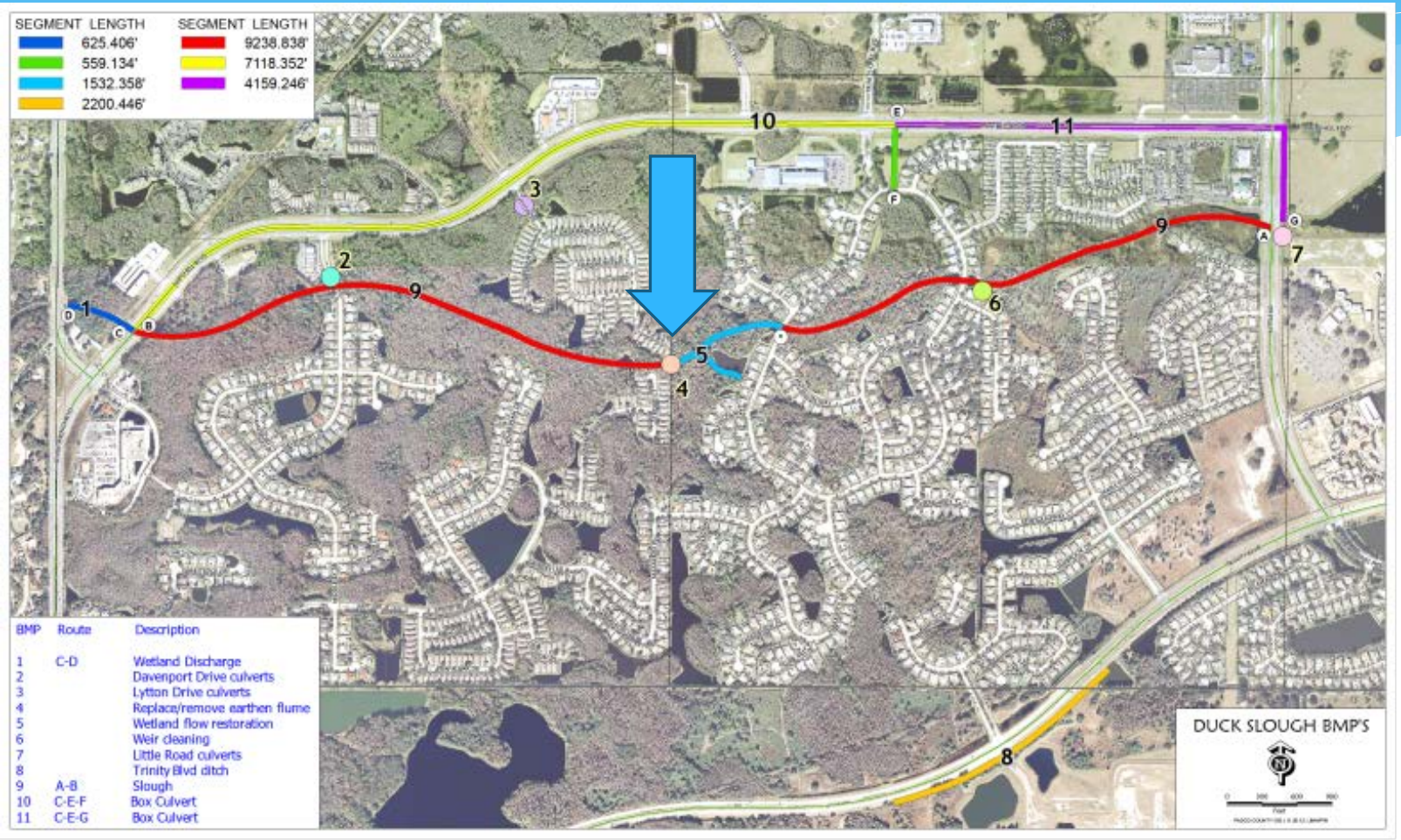


Purpose of BMP 1A

* **Creation of storage in the upstream wetland prior to a rain event**

BMP 2 & BMP 3-Culvert Cleaning

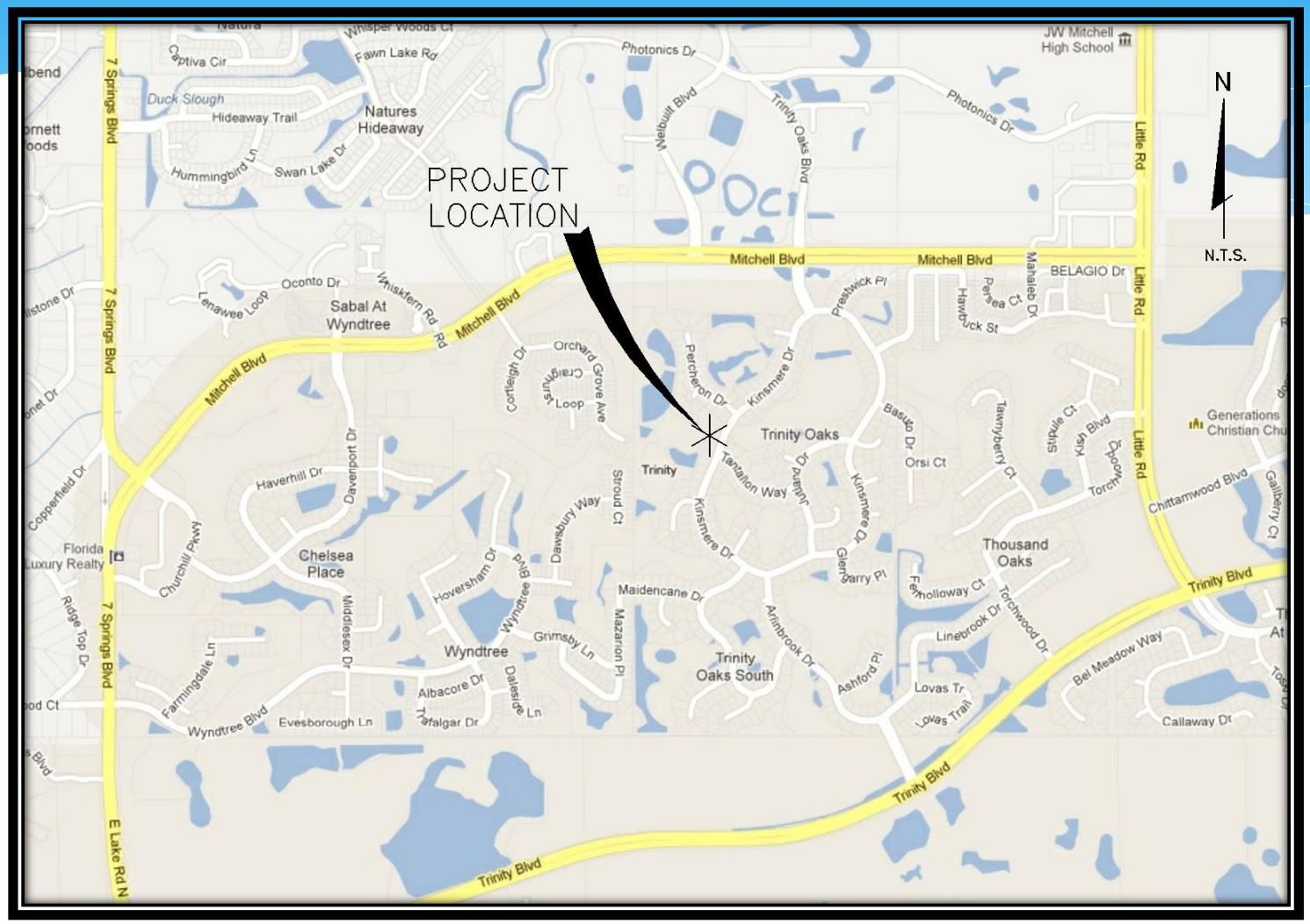
BMP 4-Removal of Earthen Berm



BMP 5-Ditch improvements

* **Purpose: to aid pond recovery**

Where is BMP 5?



BMP#5A

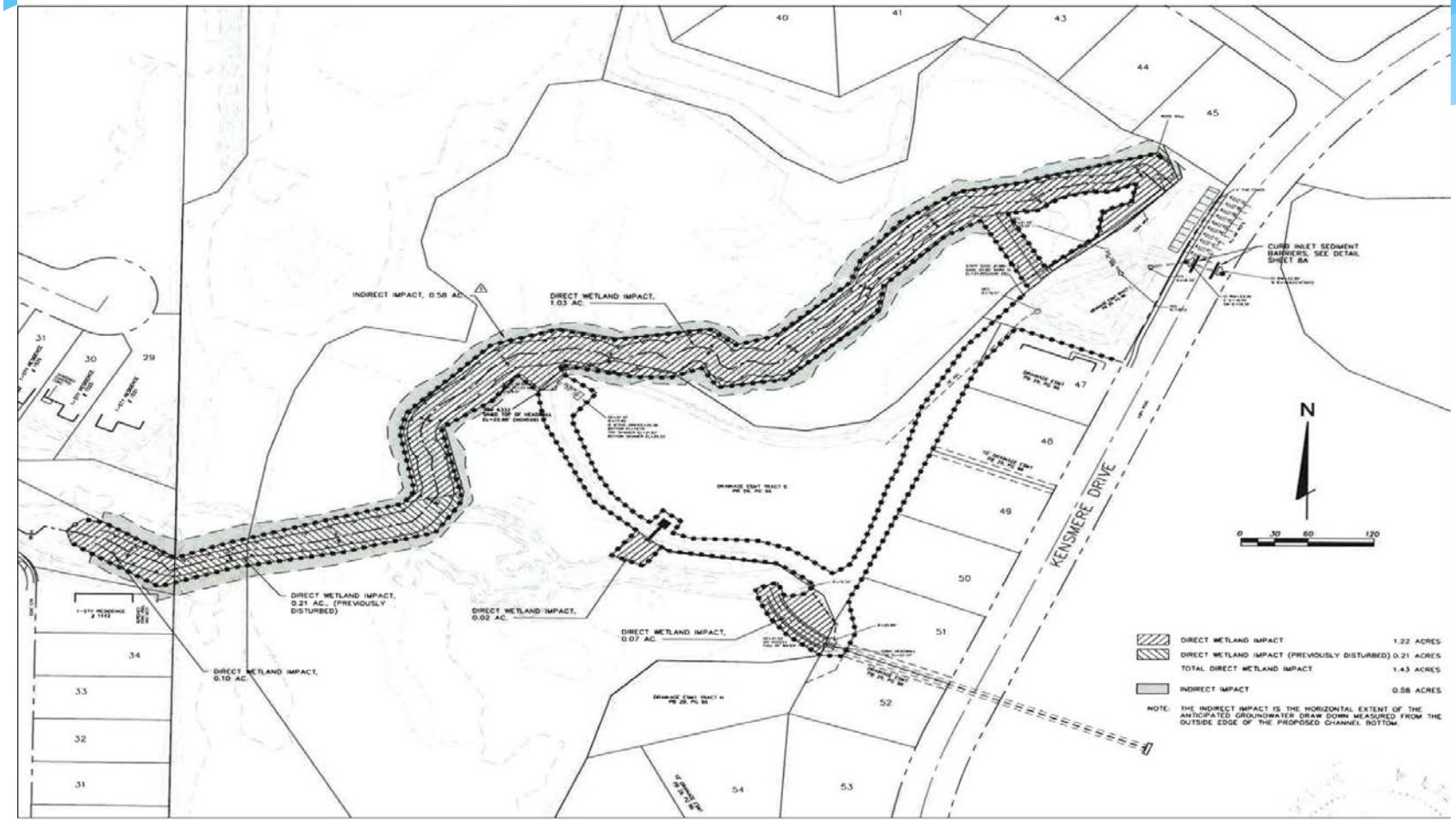
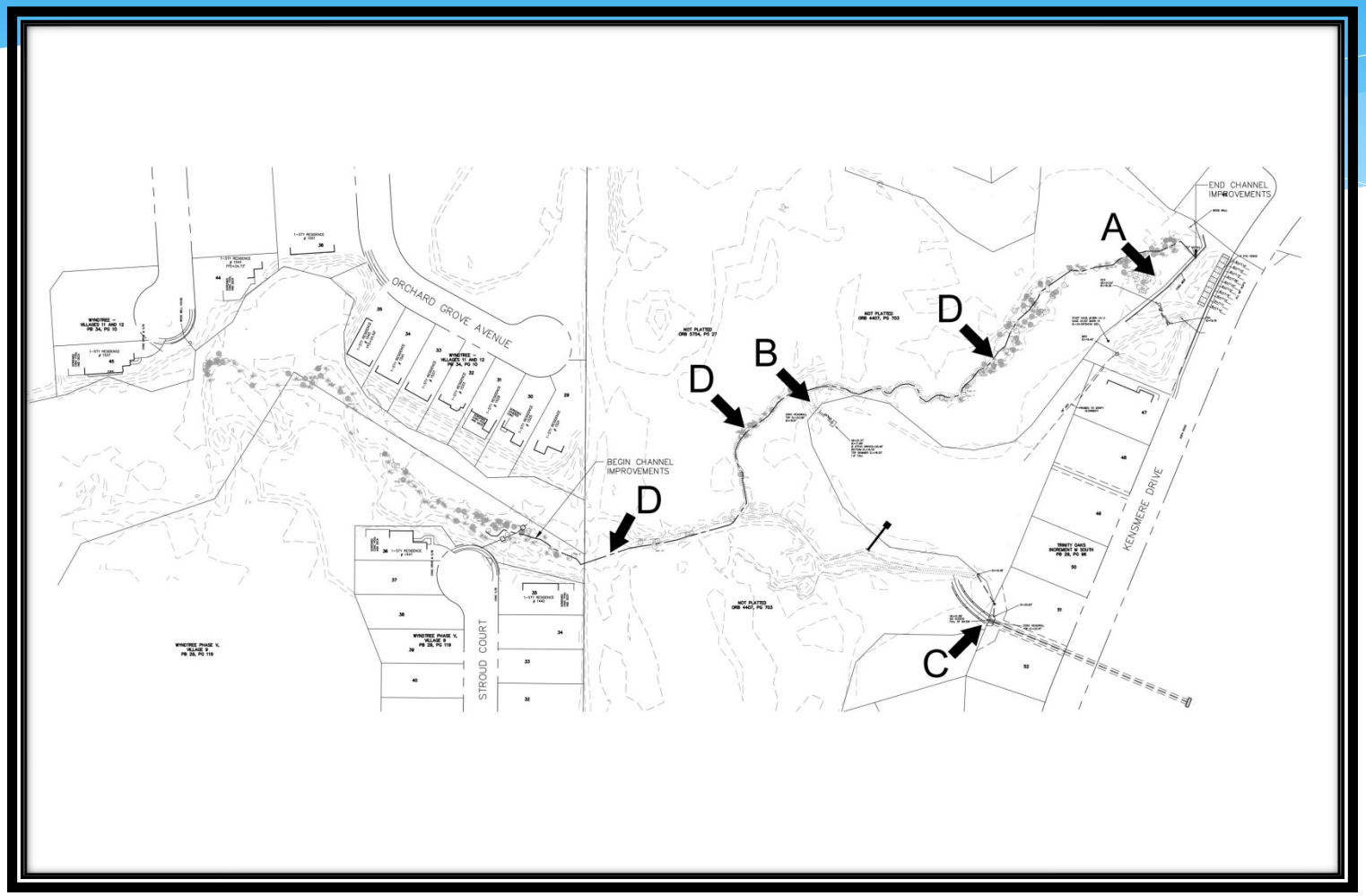

INDIRECT IMPACT, 0.58 AC.
DIRECT WETLAND IMPACT, 1.03 AC.
CURB INLET SEDIMENT BARRIERS, SEE DETAIL SHEET 8A
DIRECT WETLAND IMPACT, 0.21 AC., (PREVIOUSLY DISTURBED)
DIRECT WETLAND IMPACT, 0.02 AC.
DIRECT WETLAND IMPACT, 0.07 AC.
DIRECT WETLAND IMPACT, 0.10 AC.
KENSMERE DRIVE
N
0 30 60 120
DIRECT WETLAND IMPACT 1.22 ACRES
DIRECT WETLAND IMPACT (PREVIOUSLY DISTURBED) 0.21 ACRES
TOTAL DIRECT WETLAND IMPACT 1.43 ACRES
INDIRECT IMPACT 0.58 ACRES
NOTE: THE INDIRECT IMPACT IS THE HORIZONTAL EXTENT OF THE ANTICIPATED GROUNDWATER DRAW DOWN MEASURED FROM THE OUTSIDE EDGE OF THE PROPOSED CHANNEL BOTTOM.

Photo Key Map



Photograph at Location A

Photograph at Location B

RELOCATE OUTFALL CONTROL STRUCTURE

Photograph at Location C

REMOVE EARTHEN DAM DOWNSTREAM OF OUTFALL STRUCTURE

Photograph at Location D

REMOVE SILT FROM FLOW WAY

BMP 6-Lowering the Weir

* The current Duck Slough watershed model was used to evaluate performance of various alternatives for lowering the existing weir. The goal is to lower normal water level in the upstream wetland by one foot, while not adversely affecting downstream properties.

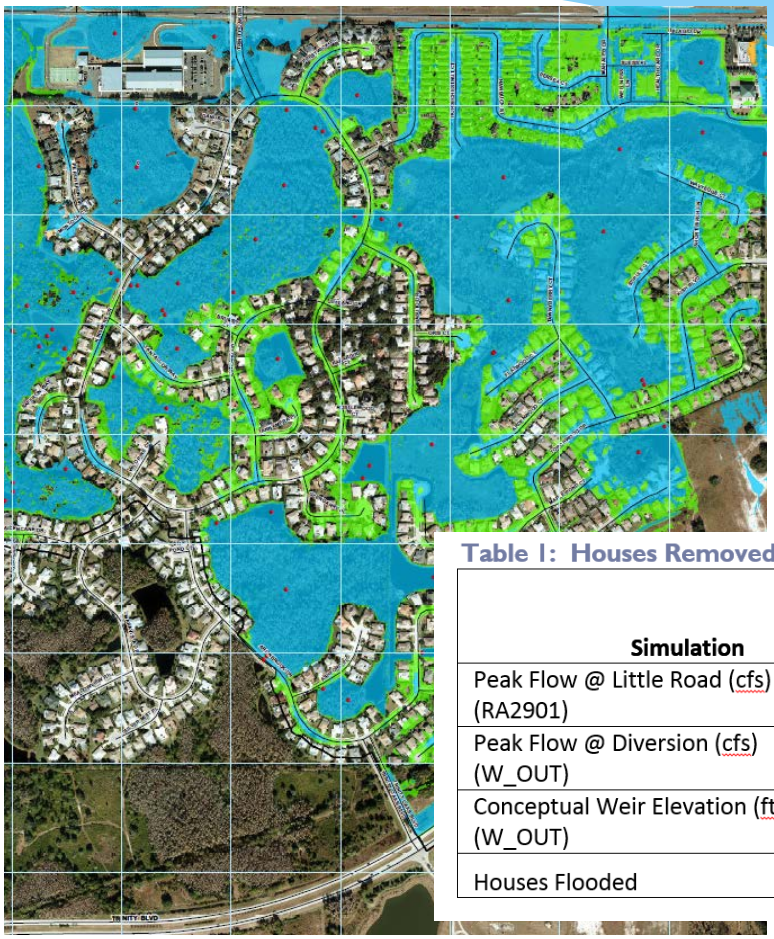
BMP 6A

BMP 7-Raising the Weir

* The current Duck Slough watershed model was used to evaluate performance of various alternatives for raising the existing weir. The goal is to reduce flow at Little Road into Thousand Oaks, sufficient to eliminate flooding of homes, while not adversely affecting adjacent properties.

BMP 7 EVALUATION

Significant Flow Reduction is Needed at Little Road to Eliminate Downstream Residential Flooding



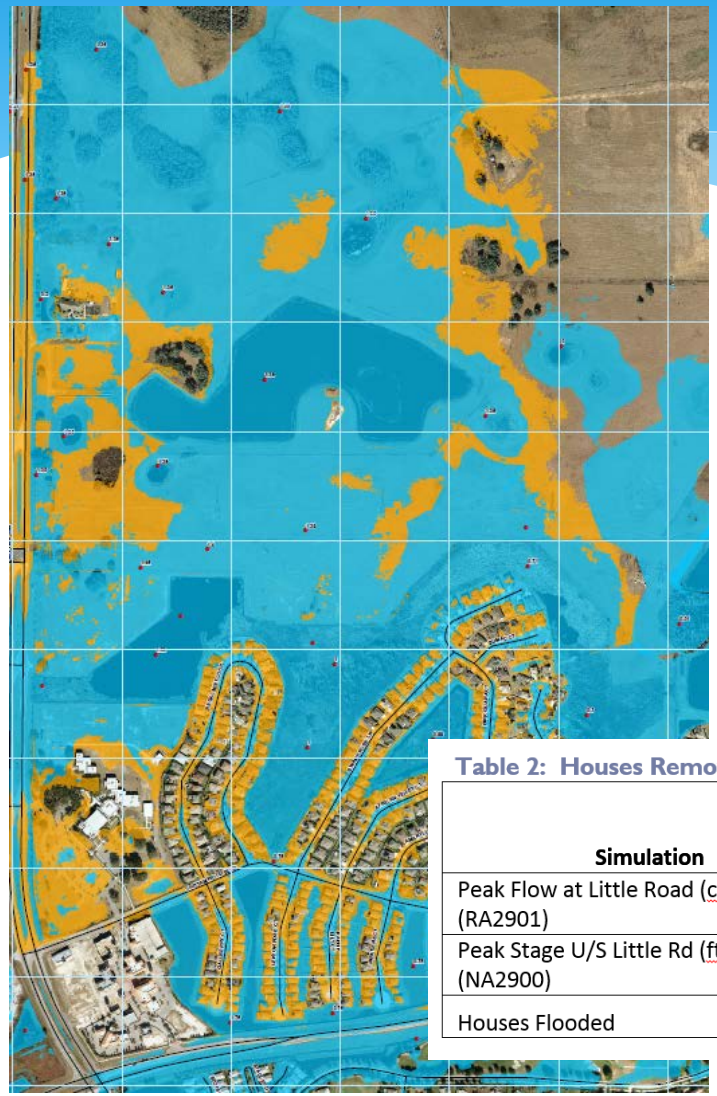
The watershed model was used to estimate the volume of stormwater that would need to be removed during a 100-Year event in order to substantially reduce or eliminate flooding risk of residential structures.

Table 1: Houses Removed from 1-Day, 100-Year Flood Risk by Conceptually Removing Water

Simulation	BMP 1,5&6	Water Removed (acre-ft)				
		1182	927	644	382	182
Peak Flow @ Little Road (cfs) (RA2901)	1760	906	1072	1247	1404	1555
Peak Flow @ Diversion (cfs) (W_OUT)	N/A	1084	905	716	501	303
Conceptual Weir Elevation (ft, NAVD88) (W_OUT)	N/A	27.25	27.50	27.75	28.00	28.25
Houses Flooded	17	1	2	5	8	11

BMP 7 EVALUATION

Raising Weir Will Impound Water Upstream



Simply raising the weir at Little Road to reduce the flow rate into Thousand Oaks results in adverse impacts upstream. In order to raise the weir, large volumes of water would need to be impounded and there is not sufficient land available on which to safely store that water.

Table 2: Houses Removed from 1-Day, 100-Year Flood Risk by Impounding Water Upstream of Little Road

Simulation	BMP 1,5&6	Conceptual Weir Elevation (ft, NAVD88)							
		26.5	27.0	27.5	28.0	28.5	29.0	29.5	30.0
Peak Flow at Little Road (cfs) (RA2901)	1760	1648	1589	1515	1432	1308	1154	994	836
Peak Stage U/S Little Rd (ft NAVD88) (NA2900)	28.73	28.95	29.06	29.22	29.41	29.65	29.90	30.11	30.26
Houses Flooded	17	16	13	9	8	7	4	1	1

BMP 7 EVALUATION

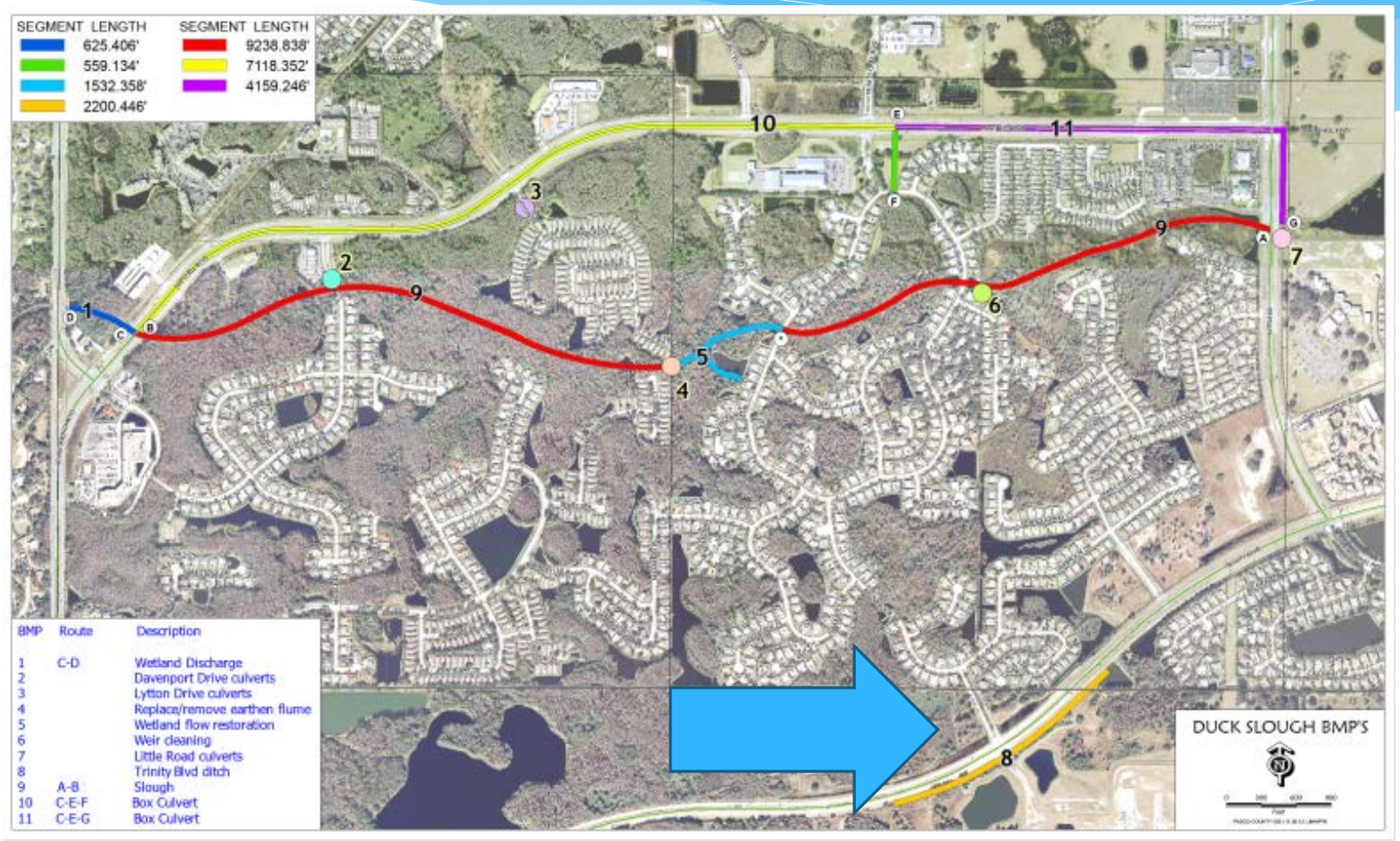
Evaluating Potential Storage Volume on Undeveloped Properties in the Area

Because water table is close to land surface, you cannot dig a deep pit to create available storage. A site like this 11-acre tract fronting Little Road accounts for only a fraction of the required storage volume, and there are few such sites available for consideration.

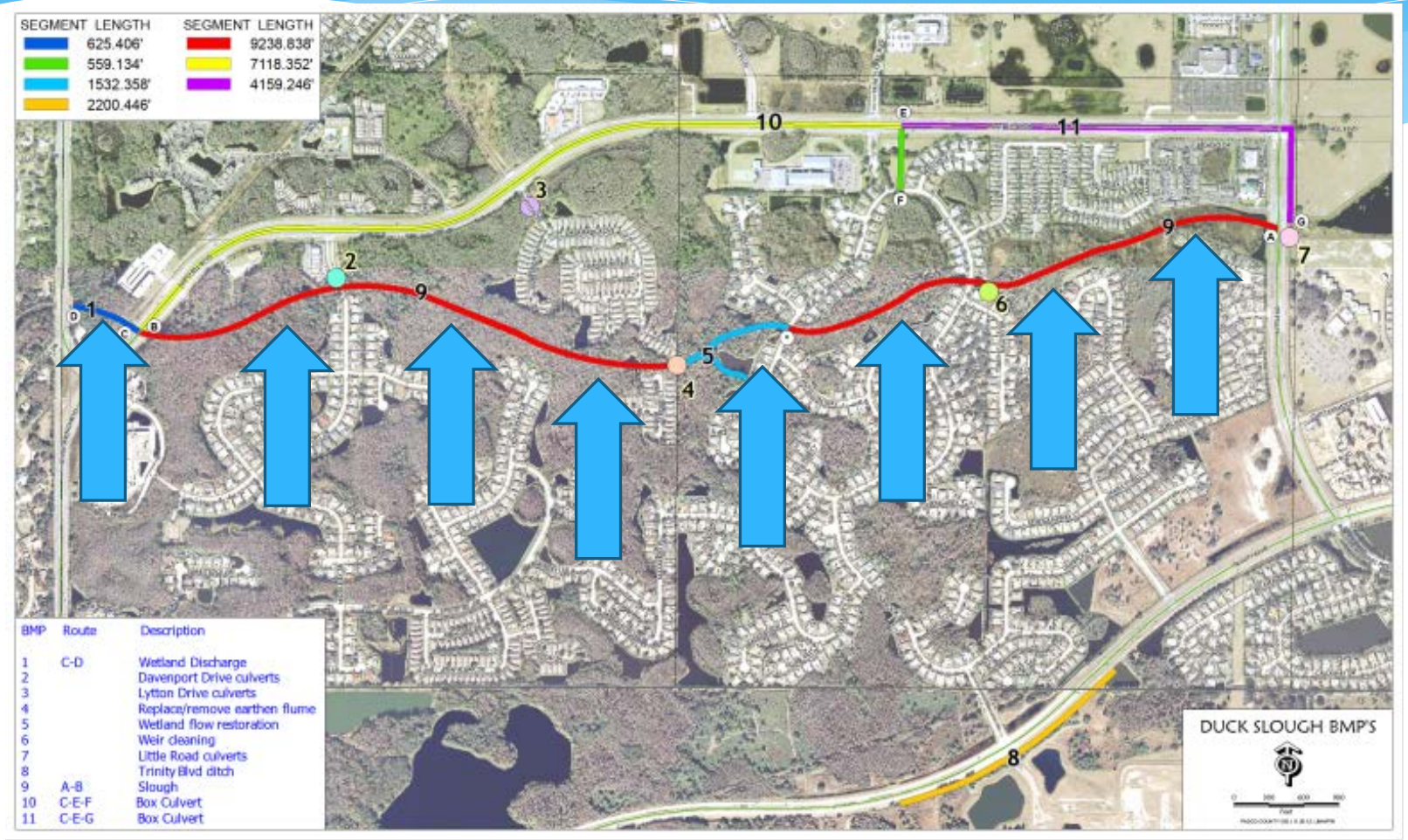
Table 3: Houses Removed from 1-Day, 100-Year Flood Risk by Using the Odyssey Property for Storage

Simulation	Existing	BMP 1,5 & 6	Utilizing Odyssey Storage	
			Existing	BMP 1,5 & 6
Peak Flow at Little Road (cfs) (RA2901)	1762	1759	1746	1742
Peak Stage U/S Little Rd (ft NAVD88) (NA2900)	28.74	28.73	28.72	28.72
Houses Flooded	17	17	17	17

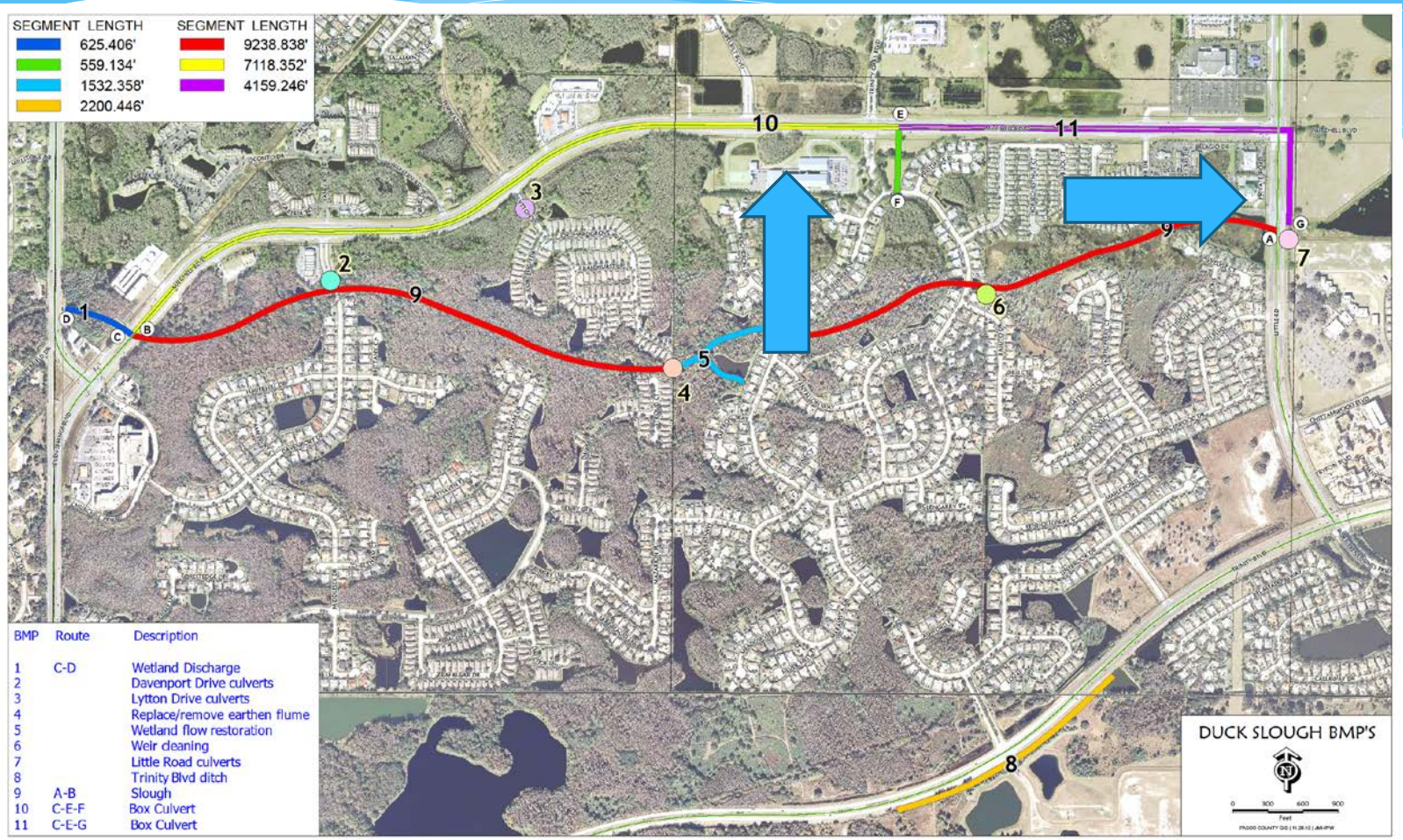
BMP 8


SEGMENT LENGTH
625.406'
559.134'
1532.358'
2200.446'
SEGMENT LENGTH
9238.838'
7118.352'
4159.246'
BMP Route Description
1 C-D Wetland Discharge
2 Davenport Drive culverts
3 Lytton Drive culverts
4 Replace/remove earthen flume
5 Wetland flow restoration
6 Weir cleaning
7 Little Road culverts
8 Trinity Blvd ditch
9 A-B Slough
10 C-E-F Box Culvert
11 C-E-G Box Culvert
DUCK SLOUGH BMP'S

BMP 9-Concrete Channel



BMP 10 & 11-Flood flow Bypass



Pursuit of Permittable Options

* BMP 1A, 5A and Associated Mitigation
* BMP 6A
* Pithlachascottee/Anclote Conservation Effort (PACE) Study
* PACE BMPs

N / W / E / S	PREPARED FOR PASCO COUNTY STORMWATER MANAGEMENT DEPARTMENT	*GIS DATA* This drawing is comprised of data obtained from a variety of sources. It is for informational purposes only and is not to be considered comprehensive for site-specific data.	PROJECT NAME **DUCK SLOUGH BMP IMPROVEMENTS**
	PREPARED BY Ardaman & Associates, Inc. FLORIDA DESIGN CONSULTANTS, INC. ATKINS SCHEDA ECOLOGICAL ASSOCIATES	*SOURCES* 2011 Aerial Photograhy Bing Maps	SHEET DESCRIPTION **PROPOSED PROJECT LOCATIONS**

F:\Blocks\GIS-Templates\24x36 - Landscape.mxt | 12/15/2008

Thousand Oaks / Trinity Oaks

Construction Activities Update
Engineering Services

Thousand Oaks / Trinity Oaks

BMP 1A

Floodgate in Open Position

Thousand Oaks / Trinity Oaks

BMP 1A

Thousand Oaks / Trinity Oaks

BMP 5A

Vicinity of Staging Area

Thousand Oaks / Trinity Oaks

BMP 5A

Vicinity of Staging Area

Thousand Oaks / Trinity Oaks

BMP 6A

Vicinity of BMP #6A Weir

Thousand Oaks / Trinity Oaks

BMP 6A

Vicinity of BMP #6A Weir

Thousand Oaks / Trinity Oaks

Thousand Oaks / Trinity Oaks

Thousand Oaks / Trinity Oaks

Five Mile Creek

Filled and Graded Area (Prior to Planting)

Thousand Oaks / Trinity Oaks

Five Mile Creek

Filled and Graded Mitigation Area
(Prior to Planting)

Thousand Oaks / Trinity Oaks

Questions and Comments

BMP 6

* Stormwater Management

BMP 6

Lowering the Normal Water Level of the Wetland Upstream of East Kinsmere

The goal is to lower normal water level in the upstream wetland by one foot, while not adversely affecting downstream properties.

BMP 6

* Funding from State
* Funding from SWFWMD Cooperative Funding

Operation of the Gates

* Stormwater Management

North
Scale: 1" = 500'
GRAPHIC SCALE
0 250 500 1000
(IN FEET)

NOTES

1. This control gate will remain partially open at gate invert elevation 9.0 ft to cover approximately 78% of the culvert opening to mimic pre-development structure capacity. During emergency flooding conditions, the gates will be opened fully to allow full flow capacity through the culverts.
2. The staff gage at BMP # 10 is also located at the confluence of Duck Slough and Brooker Creek.
3. This control gate will remain partially open at the gate invert elevation of X.XX ft to maintain normal water levels and hydroperiods in area lakes and wetlands. During emergency flooding conditions, the gate will be opened fully to allow full flow capacity through the culverts. (Gate invert elevation to be determined by SWFWMD evaluation of the Brooker Creek Basin Study; information not available at this time.)
4. SWFWMD Permit No. 43034034.

Pasco County Public Works Department
Stormwater Management Division

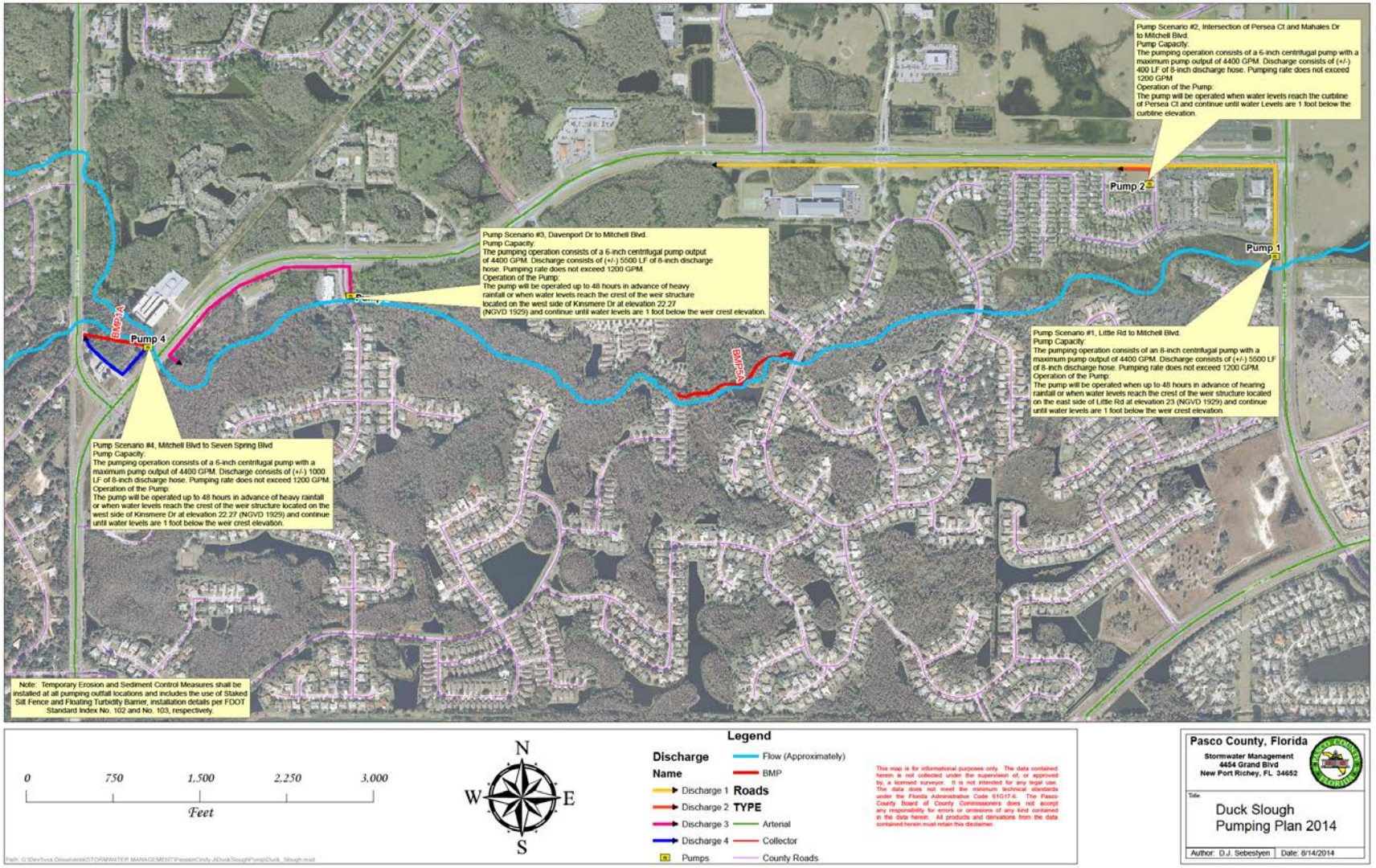
DUCK SLOUGH
STORMWATER INFRASTRUCTURE FACILITIES

STAFF GAGE LOCATION MAP

Date	Drawn by	Scale	Drwg No.
OCT 2014	PCB	1" = 500'	1 of 1

Pumping Operations

* Stormwater Management



0 750 1,500 2,250 3,000

Feet

N W E S

Legend

Discharge Name
- Discharge 1
- Discharge 2
- Discharge 3
- Discharge 4
- Pumps

- Flow (Approximately)
- BMP

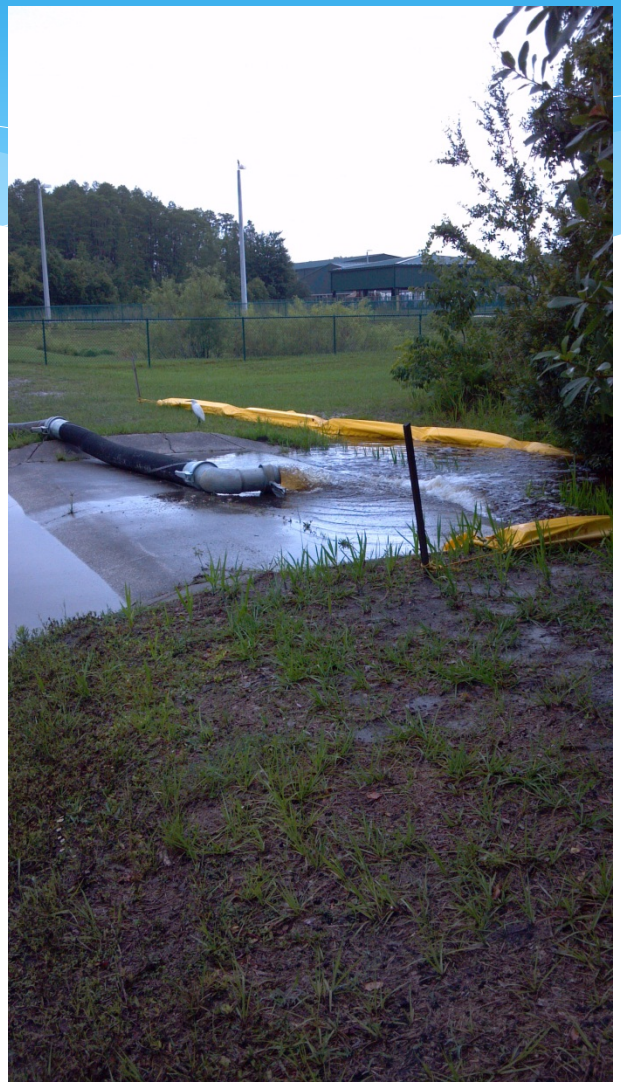
Roads TYPE
- Arterial
- Collector
- County Roads

Pasco County, Florida
Stormwater Management
4454 Grand Blvd
New Port Richey, FL 34652

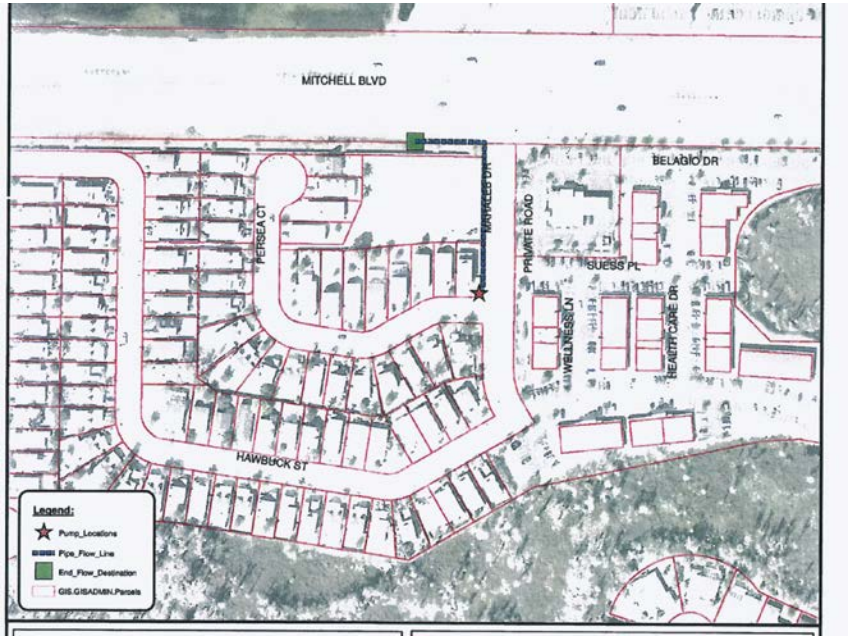
Title:
Duck Slough
Pumping Plan 2014

Author: D.J. Sebestyen | Date: 8/14/2014

Pumping - Little to Mitchell



Pumping – Persea Court



Possible Pumping Location – Davenport Drive

2013 Set Up

Possible Pumping Location- Mitchell to Seven Springs

Emergency Authorization Requested

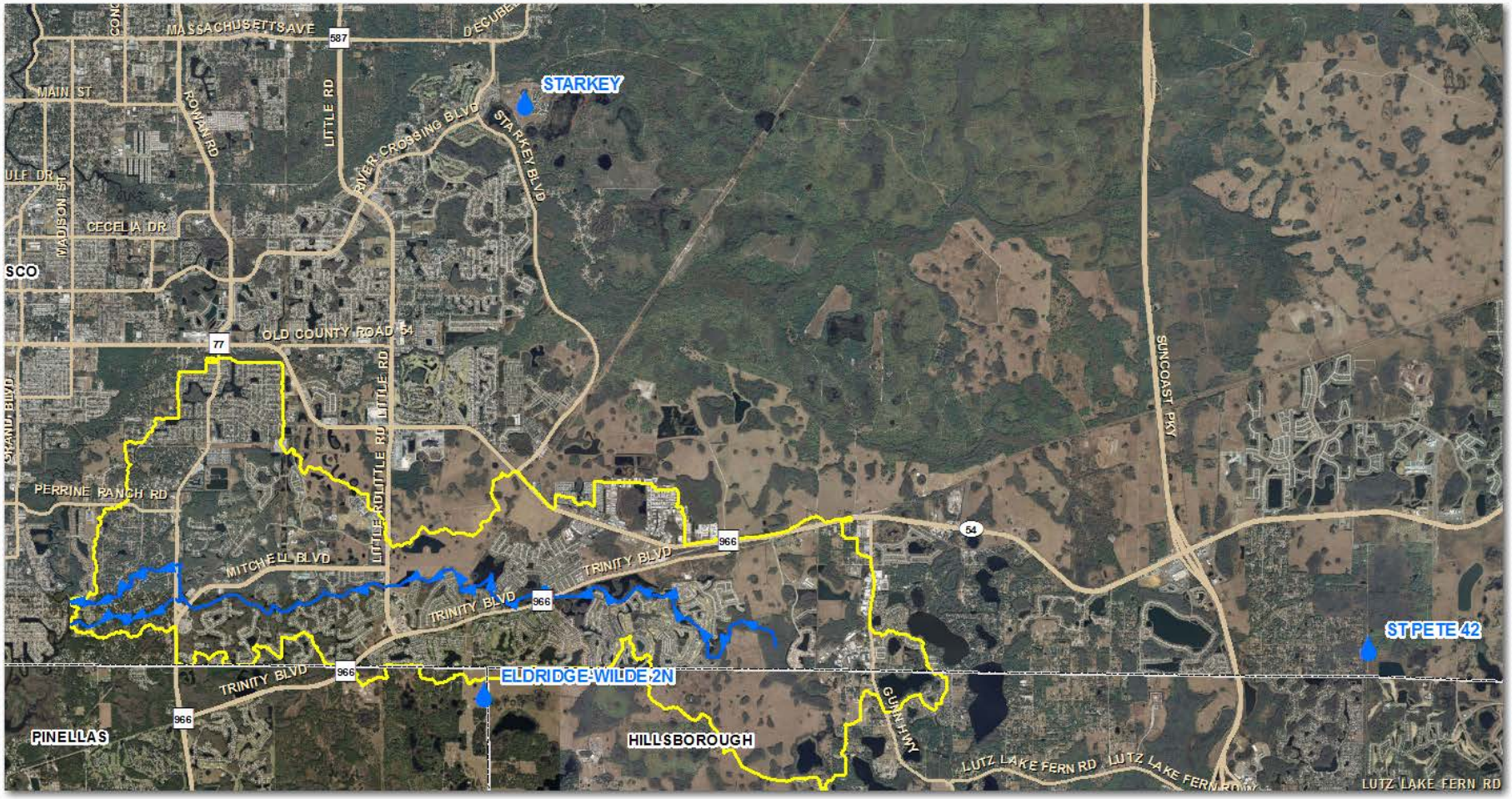
* Open gate

at BMP 1A in lieu of Pump Locations 3 & 4

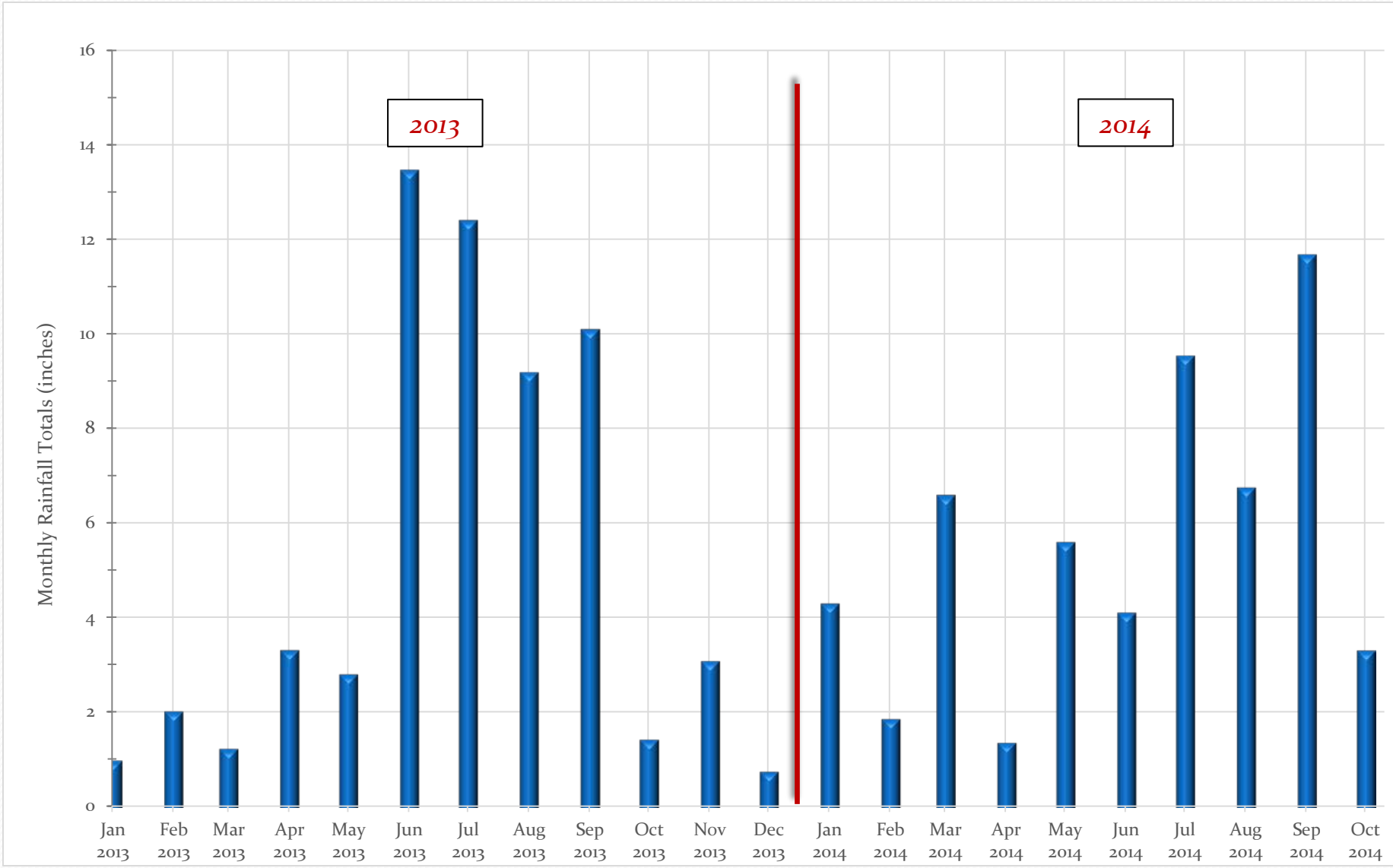
Rain Gauges & Monitoring

* SWFWMD

Rain Gauge Locations



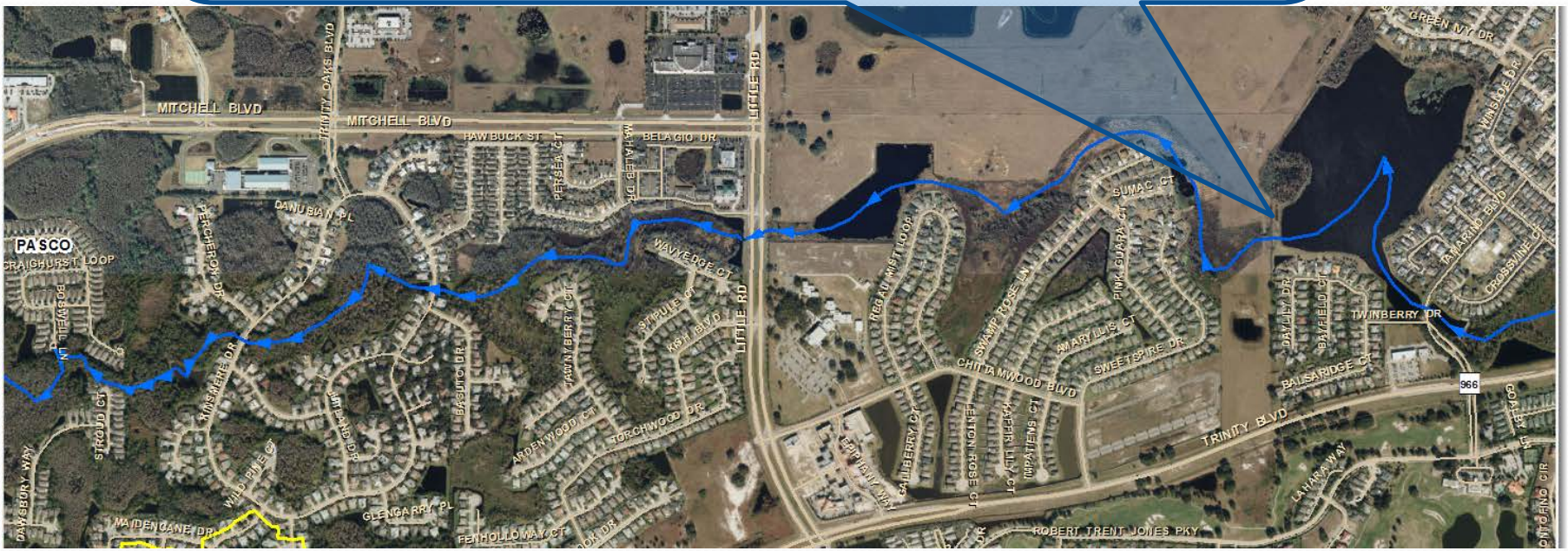
Monthly Rainfall Average



Rainfall All Gauges

Month	SWFWMD Rainfall Gauge			
	Starkey	St Pete 42	Eldridge-Wilde 2n	Avg (Duck Slough)
Jan-13	0.71	0.77	0.88	0.79
Feb-13	1.94	1.89	1.66	1.83
Mar-13	0.59	1.2	1.31	1.03
Apr-13	2.76	3.79	2.83	3.13
May-13	2.43	4.2	1.22	2.62
Jun-13	13.34	14.22	12.29	13.28
Jul-13	12.77	10.36	13.52	12.22
Aug-13	11.45	5.47	10.08	9.00
Sep-13	9.19	11.07	9.48	9.91
Oct-13	0.71	1.49	1.49	1.23
Nov-13	3.12	3.28	2.29	2.90
Dec-13	0.76	0.33	0.56	0.55
Jan-14	4.25	4.86	3.23	4.11
Feb-14	1.64	1.77	1.59	1.67
Mar-14	7.43	5.82	5.95	6.40
Apr-14	0.56	1.88	1.06	1.17
May-14	5.53	6.02	4.69	5.41
Jun-14	2.9	5.45	3.41	3.92
Jul-14	8.5	10.14	9.41	9.35
Aug-14	7.78	6.42	5.48	6.56
Sep-14	11.18	9.16	14.14	11.49
Oct-14	3.54	2.85	2.97	3.12
2013 Total	59.77	58.07	57.61	58.48
2014 (Jan-Oct)	53.31	54.37	51.93	53.20

Proposed New Gauge Location



Neighborhood Weather Watchers

* Emergency Management

Pithlachascotee /Anclote Conservation Effort (PACE)

* SWFWMD

Pithlachascotee /Anclote Conservation Effort Cooperative Funding Initiative Status

10/27/14

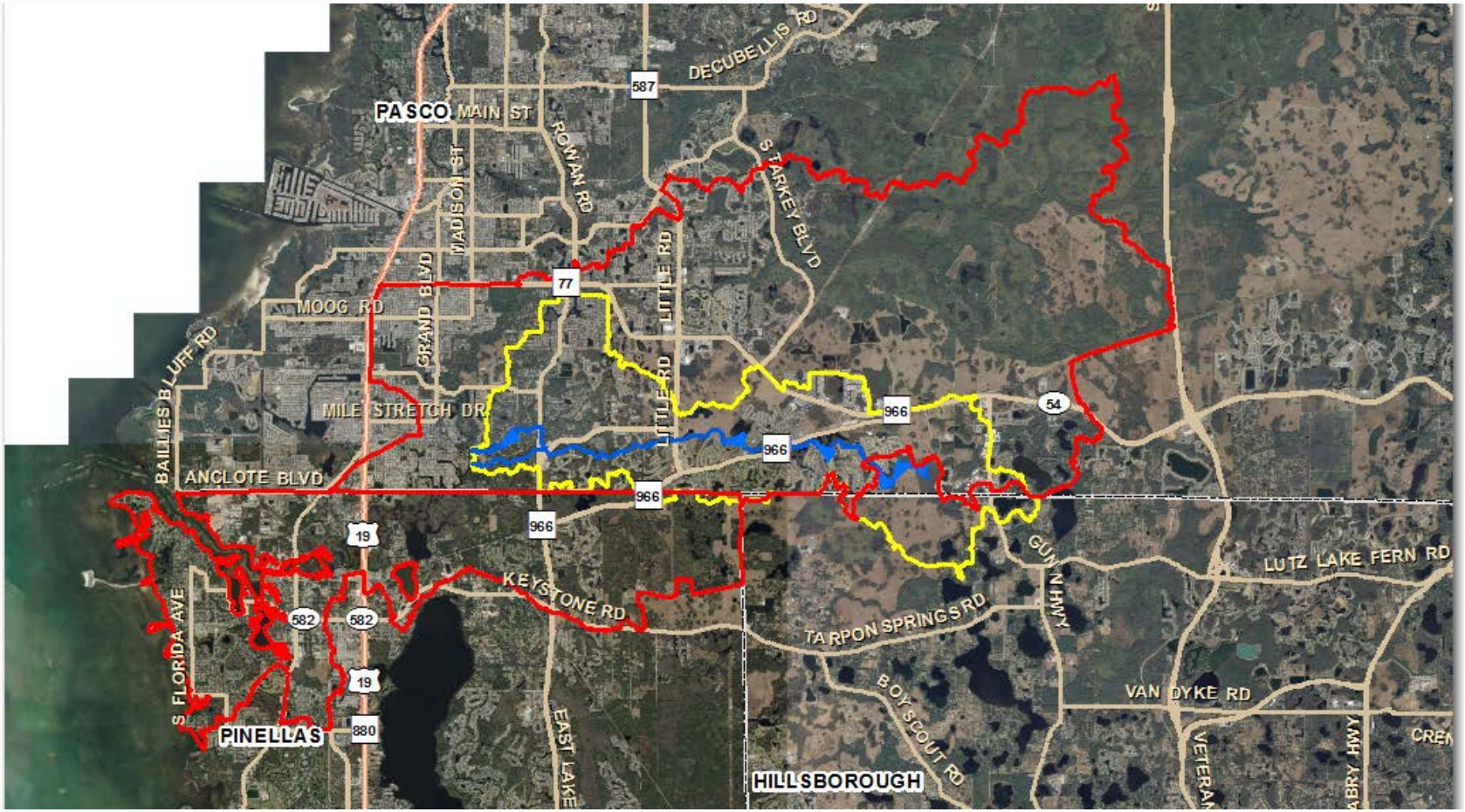
Description

- Project Number L738 (PACE)
- Multi year project
- Evaluation of regional solutions to Duck Slough flooding problems
- Flow diversion and impounding stormwater
- Total funding currently available is $2.5M
  - $1.0 M from FDEP

Anclote West

Watershed Evaluation phase underway

Duck Slough part of the Anclote West model



Status

- Data Collection
  - Collection of ERPs complete.
  - Public Notification complete.
  - Public Responses – 90 comments

Next Meeting