US Army Corps of Engineers

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): November 6, 2018

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: CESAJ-RD-SP, Wagner, Lot 132 Homeland, SAJ-2017-01506

C. PROJECT LOCATION AND BACKGROUND INFORMATION: 11534 Piping Plover Lane (Homeland Lot #132)
State:FL County/parish/borough: Palm Beach City: Lake Worth
Center coordinates of site (lat/long in degree decimal format): Lat. 26.591642° **N**, Long. 80.231071° **W**.
Universal Transverse Mercator:
Name of nearest waterbody: Homeland canal
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: SFWMD C-51 canal
Name of watershed or Hydrologic Unit Code (HUC): Florida Southeast Coast (03090206)
☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
☐ Office (Desk) Determination. Date:
☒ Field Determination. Date(s): July 6, 2017

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** *"navigable waters of the U.S."* within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]
☐ Waters subject to the ebb and flow of the tide.
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
   - ☐ TNWs, including territorial seas
   - ☐ Wetlands adjacent to TNWs
   - ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
   - ☐ Non-RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
   - ☒ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
   - ☐ Impoundments of jurisdictional waters
   - ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
   Non-wetland waters: linear feet: width (ft) and/or acres.
   Wetlands: 1.10 acres.

   c. **Limits (boundaries) of jurisdiction** based on: **1987 Delineation Manual**
   Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   ☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
   Explain: .

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[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW
Identify TNW: **SFWMD C-51 canal**.

Summarize rationale supporting determination: "Navigation and recreation are authorized project purposes for the C&SF Project. The U.S. Court of Claims has found that the navigational purpose applies to the entire C&SF Project. Therefore all C&SF Project canals, lakes, and water conservation areas are Navigable Waters of the United States." .

2. Wetland adjacent to TNW
Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:
Watershed size: SFWMD C-51 Basin 177 **square miles**
Drainage area: SFWMD C-51 East sub-basin 77 **acres**
Average annual rainfall: 60 inches
Average annual snowfall: inches

(ii) Physical Characteristics:
(a) Relationship with TNW:
☒ Tributary flows directly into TNW.
☒ Tributary flows through **2** tributaries before entering TNW.

Project waters are **5-10** river miles from TNW.
Project waters are **1 (or less)** river miles from RPW.
Project waters are **5-10** aerial (straight) miles from TNW.
Project waters are **1 (or less)** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: .

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

Identify flow route to TNW[5]: Drainage of the District C-51 Basin is generally accomplished by a system of west/east lateral canals (L-1 to L-12) and by six north/south equalizing canals (E-1, E-2, E-2W, E-2E, E-3 and E- 4). The SFWMD C-51 Canal serves as the major collector of flow for this basin. Runoff is conveyed from the interior network of laterals to the equalizing canals. The equalizing canals discharge from the south and north into the C-51 Canal, which flows east to the Lake Worth Lagoon. The physical proximity of the wetland is 230 feet from the RPW - Tributary A1 (un-named drainage canal/ storm-water lake to the south) and 160 feet from the RPW - Tributary A2 (un-named drainage canal to the north) that are connected to an internal drainage system of interconnected lakes and ditches (tertiary drainage within the Homeland Subdivision) that outfall to the Lake Worth Drainage District (LWDD) E-1 canal - Tributary B (seconday drainage system) to the east. The LWDD E-1 is connects through the South Florida Water Management District (SFWMD) CS&F C-51 canal, also a TNW out to the Atlantic Ocean. The internal canals (RPWs) of the Homeland subdivision and the E-1 are tributaries to the identified TNW.

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Tributary stream order, if known: First.

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural

☒ Artificial (man-made). Explain: Tributary A1 & A2 are part of an internal/interconnected tertiary drainage system of the Homeland subdivision.

☒ Manipulated (man-altered). Explain: Tributary B is the LWDD E-1 (secondary drainage canal) and SFWMD C-51 (primary drainage canal of C&SF Project - TNW) .

Tributary properties with respect to top of bank (estimate):

Average width: Tributary A: 60 feet; Tributary B: 40 feet

Average depth: feet

Average side slopes: **2:1.**

Primary tributary substrate composition (check all that apply):

☐ Silts ☒ Sands ☐ Concrete

☐ Cobbles ☐ Gravel ☒ Muck

☐ Bedrock ☒ Vegetation. Type/% cover: sod

☐ Other. Explain: .

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: sodded and maintained to prevent erosion.

Presence of run/riffle/pool complexes. Explain: .

Tributary geometry: **Relatively straight**

Tributary gradient (approximate average slope): %

(c) Flow:

Tributary provides for: **Seasonal flow**

Estimate average number of flow events in review area/year: **20 (or greater)**

Describe flow regime: Initial drainage (tertiary layer) includes water that flows from impervious systems, such as roofs, driveways, and roadways into ponds, natural depressions (wetlands), and swales. Any stormwater that is not held by the swales is absorbed into the ground and/or moves through a network of maintained canals, which is known as the tertiary layer of the drainage system. The tertiary layer moves into the secondary layer of drainage that consists of E-1 canal that is within the Lake Worth Drainage District control/responsibility. The primary layer, consists of the larger canal C-51 canal. The SFWMD is responsible for primary drainage water control.

The Project Area (1.10 acre delineated wetland) serves as a natural depression that collects stormwater runoff, and additional water will either overland surface flow or subsurface flow into the adjacent canals (Tributary A1 and A2). Tributary A, is identified as part of the tertiary layer of drainage that is within the SFWMD permit for the Homeland Subdivision. Water from the canals flow into the LWDD's E-1 canal (Tributary B). Tributary B, is part of the secondary layer that is part of the LWDD drainage system. The canal accepts water from other secondary drainage canals and the water flows north to the SFWMD C-51 Canal (TNW and primary layer of drainage).

Other information on duration and volume: .

Surface flow is: **Overland sheetflow.** Characteristics: See Memorandum dated June 11, 2018 and Short Term Well Study (Attachment).

Subsurface flow: **Yes**. Explain findings: See Memorandum dated June 11, 2018 and Short Term Well Study (Attachment).

☐ Dye (or other) test performed: .

Tributary has (check all that apply):

☒ Bed and banks

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

☒ OHWM[6] (check all indicators that apply):

- ☒ clear, natural line impressed on the bank
- ☐ changes in the character of soil
- ☒ shelving
- ☒ vegetation matted down, bent, or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other (list):
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☐ High Tide Line indicated by:

- ☐ oil or scum line along shore objects
- ☐ fine shell or debris deposits (foreshore)
- ☐ physical markings/characteristics
- ☐ tidal gauges
- ☐ other (list):

☒ Mean High Water Mark indicated by:

- ☒ survey to available datum;
- ☒ physical markings;
- ☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Explain: Tannin stained, clear, lawn runoff water. Water quality varies depending on the rate of flow, and quantity of water.

Identify specific pollutants, if known: Pollutants include nitrogen and phosporus from lawn fertilizers, as well as sediments from side slopes, equestrian use and pesticides.

[6]A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

[7]Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

☐ Riparian corridor. Characteristics (type, average width): .

☒ Wetland fringe. Characteristics: Along the banks of Tributaries A1 & A2 are littoral shelves containing obligate, facultative wet, and facultative emergent vegetation.

☒ Habitat for:

☒ Federally Listed species. Explain findings: The canal and wetland system can be considered wood stork foraging habitat. SFH supports and concentrates, or is capable of supporting and concentrating small fish, frogs, and other aquatic prey.

☒ Fish/spawn areas. Explain findings: Tributaries are RPWs with depth and duration that supports fish species present in canal system.

☐ Other environmentally-sensitive species. Explain findings: .

☒ Aquatic/wildlife diversity. Explain findings: habitat present to support benthic macroinvertebrates, amphibians, reptiles, small mammals and bird species.

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size:1.10acres

Wetland type. Explain: Palustrine forested wetland.

Wetland quality. Explain:very good - wetland vegetation is mostly native (cypress, red maple, sawgrass, royal fern, pickerelweed, swamp fern), soils hydric and hydrology appropriate for type of wetland system.

Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:

Flow is: **Ephemeral flow**. Explain: When wetland located within the project area becomes saturated from rainfall occuring during the wet season, the additional waters may flow into Tributary A1 or A2 as per the design of the SFWMD stormwater management plan outlined in the Environmental Resource Permit (50-00466-S).

Surface flow is**: Overland sheetflow**

Characteristics: See Memorandum dated June 11, 2018 and Short Term Well Study (Attachment).

Subsurface flow: **Yes**. Explain findings: See Memorandum dated June 11, 2018 and Short Term Well Study (Attachment).

☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:

☐ Directly abutting

☒ Not directly abutting

☒ Discrete wetland hydrologic connection. Explain: See Memorandum dated June 11, 2018 and Short Term Well Study (Attachment).

☒ Ecological connection. Explain: See Memorandum dated June 11, 2018 and Short Term Well Study (Attachment).

☒ Separated by berm/barrier. Explain: See Memorandum dated June 11, 2018 and Short Term Well Study (Attachment).

(d) Proximity (Relationship) to TNW

Project wetlands are **5-10** river miles from TNW.

Project waters are **5-10** aerial (straight) miles from TNW.

Flow is from: **Wetland to navigable waters.**

Estimate approximate location of wetland as within the **50 - 100-year** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: The standing water within wetland potentially has areas of low dissolved oxygen since the water does not receive much mixing or flow. The hydrology was constant and consistent for type of wetland. The wetland provides pretreatment of water from neighboring parcels. Waters within the wetland may contain pesticides, fertilizers, or other pollutants from adjacent single family equestrian residences.

Identify specific pollutants, if known: .

(iii) Biological Characteristics. Wetland supports (check all that apply):

☐ Riparian buffer. Characteristics (type, average width): .

☒ Vegetation type/percent cover. Explain: It was determined that the site contained Waters of the U.S. by use of the Corps of Engineers Wetland Delineation Manual, January 1987, and Regional Supplement to the Corps of Engineers Wetlands Delineation manual: Atlantic and Gulf Coastal Plain Region, October 2008 ("Supplement to the 87 Manual"). The Corps utilized the 3-parameter test to determine whether the wetlands were present onsite. A Site visit conducted July 6, 2017, verifying that it is a wetland.

☒ Habitat for:

☒ Federally Listed species. Explain findings:wood stork foraging habitat.

☒ Fish/spawn areas. Explain findings:standing water indicate the likely presence of fish or small amphibians.

☒ Other environmentally-sensitive species. Explain findings:State listed wading birds.

☒ Aquatic/wildlife diversity. Explain findings:Wading birds and small mammals would typically utilize similar wetland

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3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **15-20**

Approximately (143.64) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
W 1 (Y)	21.00	W 13 (Y)	1.80
W 2 (Y)	3.71	W 14 (Y)	2.00
W 3 (Y)	2.42	W 15 (N)	4.09
W 4 (Y)	30.46	W 16 (N)	4.28
W 5 (Y)	2.00	W 17 (N)	48.24
W 6 (Y)	1.35		
W 7 (Y)	0.61		
W 8 (N)	3.65		
W 9 (N)	8.83		
W 10 (N)	5.30		
W 11 (Y)	2.00		
W 12 (Y)	1.90		

Summarize overall biological, chemical and physical functions being performed: The 143.64 acres of adjacent to the Tributary A1, A2 and B serve as habitat for listed and non-listed species, provide water quality treatment for stormwater runoff from adjacent properties, stormwater storage and groundwater recharge.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

   Note: On 1 December 2008, the US Supreme Court declined to hear the McWane/Robison case. This case involved a federal appeals court (11th Circuit) ruling that had the effect of overturning a criminal conviction of an industrial pipe manufacturer found guilty of illegally dumping oil, lead, zinc, grease, and other pollutants into Avondale Creek in Alabama, a permanently flowing stream that eventually flows into the navigable Black Warrior River. The appeals court overturned the case because they interpreted the Rapanos decision as requiring a significant nexus determination on all waters except TNWs and wetlands adjacent to the TNWs, and in this case a significant nexus determination was not performed on Avondale Creek, an RPW.

The 2 December 2008 Rapanos guidance acknowledges (footnote 16, bottom of page 3) the Supreme Court's refusal to hear the McWane/Robison case. Therefore, in the 11th Circuit (Florida, Georgia, and Alabama) the McWane/Robison decision, which contradicted the June 2007 Rapanos Guidance concerning jurisdiction of RPWs and wetlands directing abutting RPWs, is final. Therefore, when performing an approved JD, the Corps must perform a significant nexus determination on ALL waters and wetlands except for TNWs and wetlands adjacent to TNWs.

Physical: This project lies within the 8 digit United Stated Geological Survey (USGS) Hydrologic Unit Code 03090206 known as Florida Southeast Coast, and encompasses 3128 square miles. The subject reach is located less than 10 river miles from the South Florida Water Management District (SFWMD) C-51 canal a TNW. Information was reviewed to determine how the site being reviewed fit into the context for the relevant reach (RR) and the C-51 canal. Numerous sources were used to collect different data used in this determination. The following is a summary of the factors most relevant to the jurisdictional status under the Clean Water Act for the waters being reviewed. The Lake Worth Drainage District (LWDD) secondary canal (E-1) is directly and hydrologically connected to the C-51 Canal (TNW). The tertiary canals located within the Homeland subdivision have a direct hydrologic connection to the LWDD E-1. Pipes, culverts, weirs and pump stations do not sever the hydrology and jurisdictional. 33 CFR 328.3(a): a tributary remains under the Clean Water Act jurisdiction even if it flows through a manmade pipe for some portion of its length. The water level in the C-51, and E-1 canals are kept at a constant elevation for flood prevention in the event of heavy storms or droughts. Water is pumped out of the canals on an as needed basis not to allow for continuous flow. The RR for the wetland onsite is less than 5 riverine miles from the C-51 (TNW). The subject wetland is adjacent to the Homeland canal.

Chemical: Wetlands and adjacent canals are a source of beneficial material, energy, inorganic nutrients, organic matter, and organisms. In this case these conveyances of water can remove harmful materials such as sediments and pollutants. These waters of the US would have the capacity to both carry pollutants and flood waters to TNWs and to reduce the amount of pollutants or flood waters reaching a TNW through their natural water filtration functions. The primary functions these WOTUS include water storage, organic carbon cycling, maintaining a characteristic plant community and providing characteristic wildlife habitat. Water storage is the capacity to store water for a few days to a few weeks. Storage alters the amount and timing of runoff from a catchment into adjacent canals, reducing the pulse of runoff that occurs following a storm or draught. Prolonged saturation leads to anaerobic soil conditions and initiated chemical reaction that are highly dependent upon the redox capacity of the soil.

Biological: The plant community provides the foot and habitat structure needed to maintain the characteristic animal community. The ability to maintain a characteristic plant community is important because many plant species can only occur in a particular plant community and their maintenance and abundance are linked. The presence of a characteristic plant community is also critical in maintaining various biotic and abiotic processes occurring in wetlands. Wetlands and their RR provide habitat for numerous species of amphibians, reptiles, fish, birds and mammals and play key roles in ecosystem structure and stability. Many of these require both wetland and adjacent upland habitats and the organisms themselves serve as a conduit for energy exchange between the different habitat systems.

For these reasons, the RR provides a substantial effect on the chemical, physical and biological integrity of the C-51 canal by providing habitat, flood water retention, ground water recharge and water filtration. Tributaries A1 and A2, the Homeland canal, and the LWDD E-1 canal collectively have a chemical, physical and biological connection to the SFWMD C-51 canal, as described above and in Section IIIB(1)(ii). The functions provided by the canals, on-site wetlands, and similarly situated off-site wetlands have a significant combined effect on the physical, chemical, and biological integrity of the C-51 Canal. Direct physical, chemical and biological relationships exists between water environments (wetland and canals). Due to the close proximity of the onsite wetlands and the canal and the lack of impeding barriers, it is can be determined that a Significant Nexus exists between this relevant reach, its similarly situated adjacent wetlands and the downstream TNW.

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

   Provide estimates for jurisdictional waters in the review area (check all that apply):
   - ☐ Tributary waters: linear feet width (ft).
   - ☐ Other non-wetland waters: acres.

Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
   ☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional waters within the review area (check all that apply):
   ☐ Tributary waters: linear feet width (ft).
   ☐ Other non-wetland waters: acres.
   Identify type(s) of waters: **.**

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
   ☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: **.**

   ☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☒ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

   Provide acreage estimates for jurisdictional wetlands in the review area: **1.10**acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
   ☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
   As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
   ☐ Demonstrate that impoundment was created from "waters of the U.S.," or
   ☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
   ☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: .
☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

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[8]See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.*

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
☐ Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☒ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps: .
☐ Corps navigable waters' study: .
☐ U.S. Geological Survey Hydrologic Atlas: .
☐ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.
☐ U.S. Geological Survey map(s). Cite scale & quad name: .
☒ USDA Natural Resources Conservation Service Soil Survey. Citation: .
☐ National wetlands inventory map(s). Cite name: .
☐ State/Local wetland inventory map(s): .
☐ FEMA/FIRM maps: .
☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date): .
or ☒ Other (Name & Date):Water Table & Well Study (SE Soil & Environmental Service) attached.
☒ Previous determination(s). File no. and date of response letter: PJD (SAJ-2017-01506) see administrative record.
☐ Applicable/supporting case law: .
☐ Applicable/supporting scientific literature: .
☒ Other information (please specify):Figure 1: Review area (1.10 acres delineated wetland), Figure 2: Relevant Reach, Figure 3: Tributaries A1 & A2 and connection to LWDD E-1 canal to SFWMD C-51 canal (Section /TNW), Figure 4: Similarly situated wetlands, Figure 5: SFWMD C-51 basin, Figure 6: LWDD canals, Attachment: CORPS MEMORANDUM dated June 11, 2018 (Author: Steven Currie) - review of Water Table & Well Study by SE Soil & Environmental Service.

B. ADDITIONAL COMMENTS TO SUPPORT JD: Based on the biological, chemical, and physical functions described above, this office has concluded that a Significant Nexus exists between the relevant reach tributary and its adjacent wetlands, including the project area wetlands, to the downstream TNW and therefore the project area wetlands are subject to regulation under Section 404 of the Clean Water Act.

Project: Wagner (11534 Piping Plover)
SAJ-2017-01506

Memorandum

Subject: Review of Isolated Wetland Study Submitted By Gregory Sawka (Southeast Soil & Environmental Service, Inc.) for 11534 Piping Plover Lane, Wellington, Florida. SAJ-2017-01506 Wagner.

Date: June 11, 2018

Author:

Steven Currie
Soil Scientist, CPSS/LPSC
Wetland Technical Specialist
USACE Jacksonville District

Introduction:

Southeast Soil & Environmental Service, Inc. (SSES) conducted a short term well study (Attachment A) to evaluate the potential for a surface or groundwater connection between a 1.1 acre wetland and a canal approximately 230 feet away in the southern portion of 11534 Piping Plover Lane in Wellington, Florida. The study was conducted between August 2 and October 11, 2017, during a period of greater than normal rainfall (according to the submitted report). As recorded by the rain gauge installed on-site, Hurricane Irma produced a precipitation event of 6.26 inches between September 9-10, 2017, and a total of 19.84 inches of precipitation fell during the study period. It is the position of SSES that there is no surface or apparent subsurface connection between the on-site wetland and the canal. Based on the data submitted by SSES in their report, this memorandum will show that both a surface and subsurface hydrologic connection between the wetland and canal exists and that the hydrologic interaction between the systems represents appropriate expected ecologic function.

Well Installation and Location:

SSES installed four monitoring wells according to Sprecher (2008), although they did not provide any soil piezometer/well logs which are recommended metadata essential for water level data interpretation. Submission of monitoring well data forms are also recommended procedure in the USACE Technical Standard for Water-Table Monitoring of Potential Wetland Sites (USACE 2005) which is the standard for hydrologic monitoring according to the Atlantic and Gulf Coastal Plain Regional Supplement (Supplement) (USACE 2010). This type of metadata depicts how monitoring wells are constructed by identifying the soil layers associated with the screened zone, type of sand pack, and thickness of bentonite seal.

The location of the wells is depicted in Figure 1. Two wells were placed on either side of the

ATTACHMENT

Figure 1. SSES Monitoring Well Locations.

Figure 2. USACE Recommended Well Locations.

wetland near the wetland boundary (Well 2 and 4), one well was placed in the uplands near the western boundary of the parcel (Well 3), and one well was located in the southeast portion of the property at the edge of the canal (Well 1). Well 2 within the wetland malfunctioned and is not further discussed in this memorandum. The location of these wells does not appear to be appropriate for an adequate evaluation of hydrologic connectivity. The distance between Well 4 and Well 1 is approximately 394 feet, it is not in a relatively straight line with Well 3, and a house sits between the wetland and the canal. To avoid potential influence from the house and reduce the distance between the wetland well and the canal well (230 feet), locations as depicted in Figure 2 would be recommended for well installation.

Rainfall Normality:

The report from SSES indicates that the short study period occurred during a wetter than normal timeframe, although supporting documentation was not provided. Sprecher (2008) identifies the usefulness of comparing precipitation data to long term records and provides methodology for evaluating rainfall normality. The USACE Technical Standard (USACE 2005) allows for the use of short term monitoring data if the normality of rainfall is considered. The Direct Antecedent Rainfall Evaluation Method (DAREM) (Sumner et al. 2009) is recommended for interpreting wetland hydrologic data for USACE wetland delineations and examines rainfall patterns from the previous three months to determine if the month of investigation (date aerial image was taken) was normal, above normal, or below normal compared to the 30th and 70th percentile averages (Berkowitz et al. 2017). Due to a short data collection period with the on-site rain gauge and an inconsistent precipitation data set for the region from off-site resources, a site specific analysis of rainfall normality using the DAREM was not possible. The closest weather station with a complete data set is the Palm Beach Gardens International Airport where a

DAREM analysis depicts lower periods of rainfall than what is suspected at the project site (Table 1) likely due to less of an impact from Hurricane Irma. The variable nature of recorded data within the region combined with the on-site rain gauge data suggests that there may be a significant difference in rainfall at the project site. In order to evaluate rainfall normality and develop a data set that includes periods of normal rainfall, a longer term well study would be recommended.

Table 1. DAREM Analysis Utilizing WETS Tables From West Palm Beach International Airport Weather Station.

Prior Month	Name	WETS 30th %	WETS 70th %	Measured Rainfall	Condition	Condition Value	Month Weight	Score	Result	Ratings
3rd	May	2.11	5.79	2.61	Normal	2	1	2		Dry=6-9
2nd	June	5.52	10.11	10.32	Wet	3	2	6		Normal=10-14
Most recent	July	4.14	6.66	7.44	Wet	3	3	9		Wet=15-18
Month Examined	**August 2017**						**Total**	**17**	**Wet**	

Prior Month	Name	WETS 30th %	WETS 70th %	Measured Rainfall	Condition	Condition Value	Month Weight	Score	Result	Ratings
3rd	June	5.52	10.11	10.32	Wet	3	1	3		Dry=6-9
2nd	July	4.14	6.66	7.44	Wet	3	2	6		Normal=10-14
Most recent	August	6.43	10.35	5.72	Dry	1	3	3		Wet=15-18
Month Examined	**Sep 2017**						**Total**	**12**	**Normal**	

Prior Month	Name	WETS 30th %	WETS 70th %	Measured Rainfall	Condition	Condition Value	Month Weight	Score	Result	Ratings
3rd	July	4.14	6.66	7.44	Wet	3	1	3		Dry=6-9
2nd	August	6.43	10.35	5.72	Dry	1	2	2		Normal=10-14
Most recent	September	5.68	9.76	5.78	Normal	2	3	6		Wet=15-18
Month Examined	**Oct 2017**						**Total**	**11**	**Normal**	

Soils:

The NRCS Web Soil Survey Hydric Rating By Map Unit (Figure 3, Table 2) depicts the project site to consist of Boca fine sand and Pineda fine sand, both of which are hydric soils with hydric ratings of 92 and 97 respectively. Both soil series are displayed to be located in the upland and wetland areas. Under natural conditions, the Boca series has a water table within 10 inches of the surface for two to four months of the year with rapid permeability in the surface and subsurface layers and moderate in the subsoil. Hydraulic conductivity (capacity to transmit water) of the most limiting layer is moderately high to high. SSES indicates that Pineda soils have very slow permeability, however the NRCS Soil Survey depicts rapid permeability in the sandy layers and moderately rapid in the loamy layer with a water table within ten inches of the surface for one to six months in most years. Hydraulic conductivity of the most limiting layer is high. Based on the SSES on-site soil descriptions, the wetland soil is likely better represented as Tequesta muck which is identified on the NRCS mapping in a depressional location near the project site. Under natural conditions, these soils are covered by water for four to six months in

most years and the water table is within ten inches of the surface for six to twelve months with rapid permeability in the organic and sandy surface layers and moderate to moderately rapid in the loamy subsoil. Hydraulic conductivity of the most limiting layer is moderately high to high. SSES on-site soil descriptions depict the well locations to consist of sandy surface layers which overlay a clayey layer with the wetland having a layer of muck above the sand. NRCS data indicate that the soils on-site have water tables close to or above the surface for extended periods with permeability and hydraulic conductivity conducive to transmitting water.

Figure 3. NRCS Web Soil Survey Hydric Rating By Map Unit.

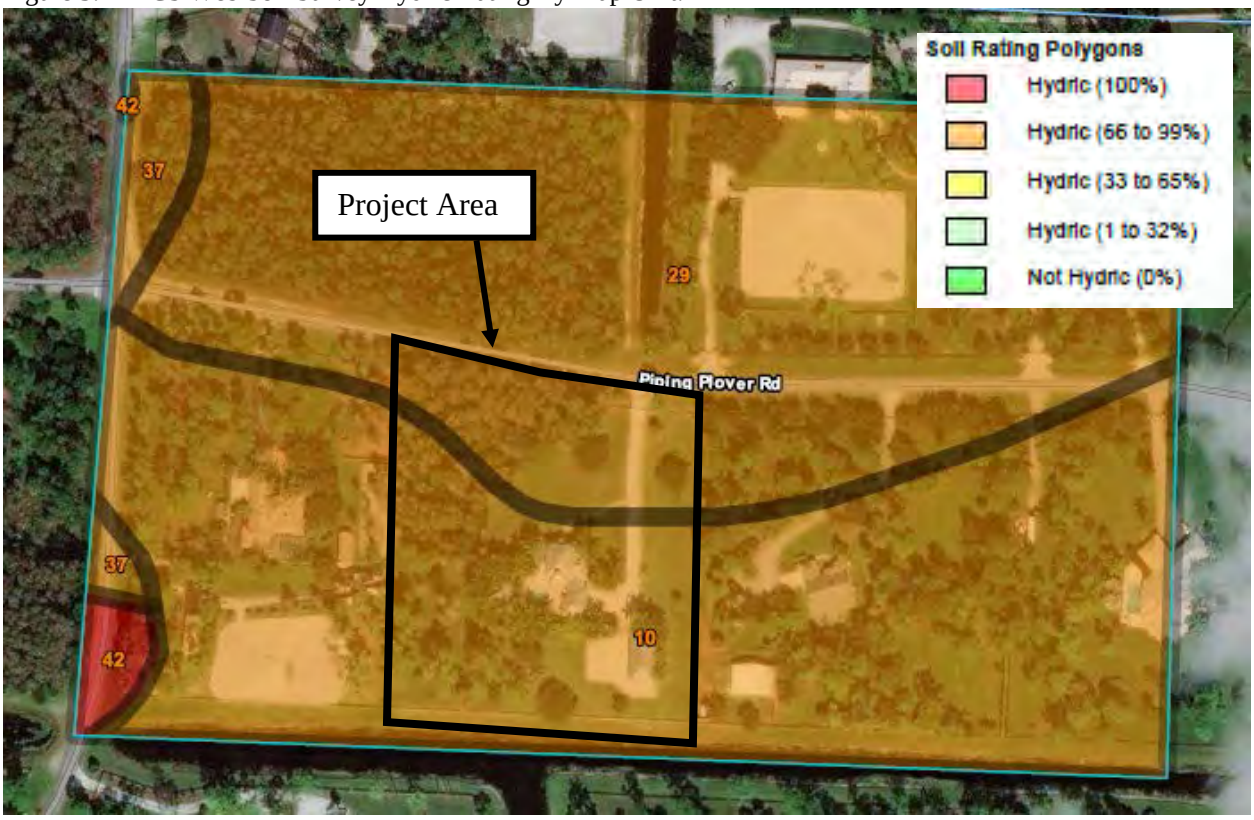


Table 2. NRCS Web Soil Survey Hydric Rating By Map Unit.

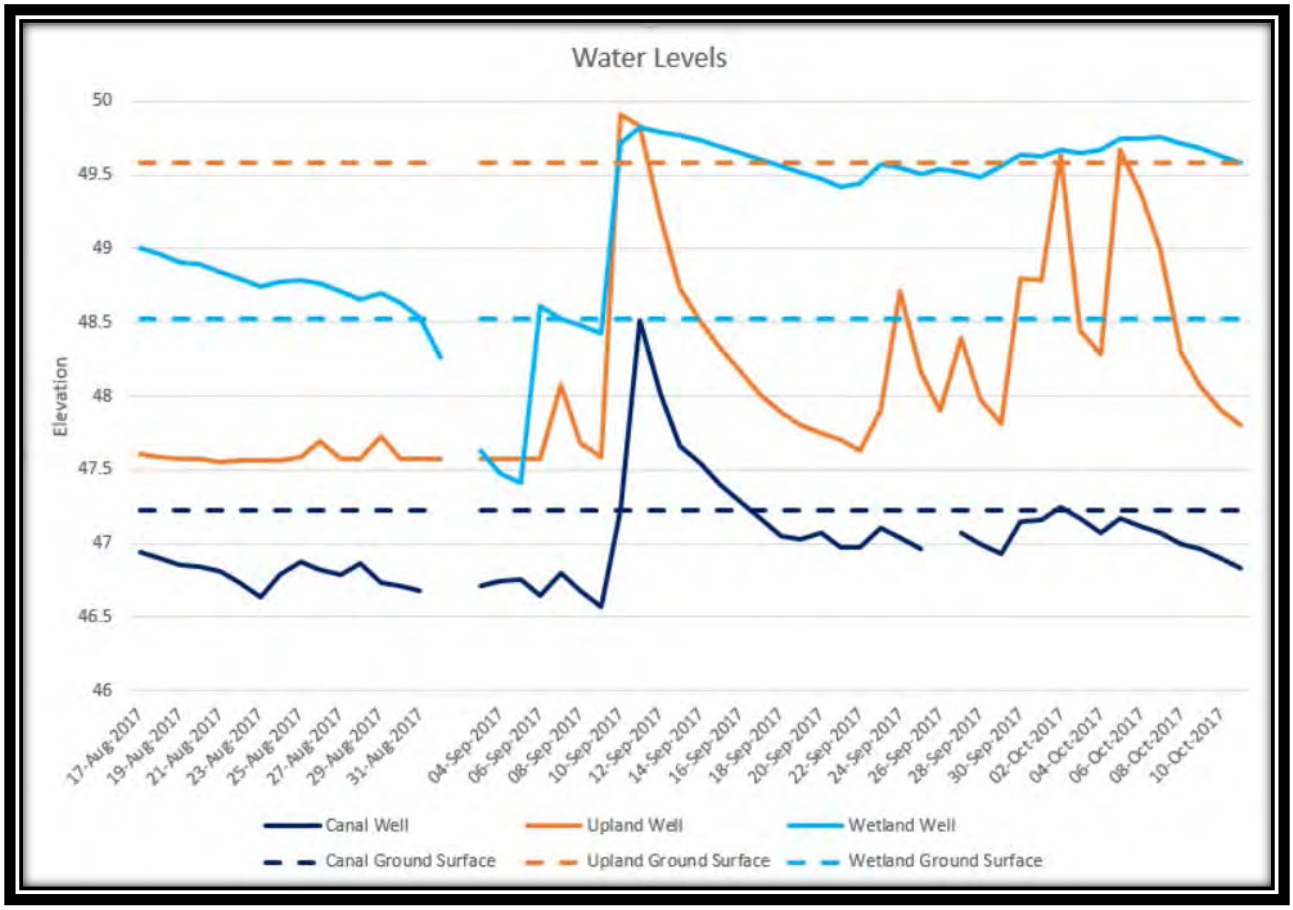
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
10	Boca fine sand, 0 to 2 percent slopes	92	13.8	46.4%
29	Pineda fine sand, 0 to 2 percent slopes	97	14.9	49.9%
37	Riviera fine sand, frequently ponded, 0 to 1 percent slopes	96	0.7	2.5%
42	Tequesta muck, frequently ponded, 0 to 1 percent slopes	100	0.4	1.2%
Totals for Area of Interest			**29.8**	**100.0%**

Water Level Data:

The presentation of water level data in the SSES report primarily focused on fluctuations within the individual wells in response to precipitation events and were not graphically compared to each other. It is the position of SSES that the wetlands are not connected horizontally to the canal by subsurface drainage and that no positive surface water outflow or hydrologic connection between the wetland and the canal were found.

In order to evaluate water levels across the site, the data submitted by SSES had to be normalized in relation to elevation by mathematical conversion as the data was presented as inches below ground surface (BGS) at each well which were located at differing elevations. The reformatted data for the three wells is presented in graphical format as Figure 4.

Figure 4. Water Level Data During The Study Period.



The data displays a gradual drawdown of the wetland water level in the beginning of the monitoring period before Hurricane Irma over September 9 and 10, 2017, and relatively stable water levels at the upland and canal well locations. It is presumed that the water levels in the uplands were below the bottom of the monitoring well during this time period. Water levels in the wetland dropped 1.59 feet from 49.00 feet (5.7 inches above ground surface (AGS)) to 47.41 feet (13.44 inches BGS) over a period of 20 days. In response to precipitation events, water levels in all three wells rose rapidly with faster declines in the upland and canal wells and water retention within the wetland. This is the type of response that would be expected across a wetland-upland-canal (tributary) landscape. It is well documented that water retention and flood attenuation are important functions provided by wetlands (USEPA 1995a, USEPA 1995b, Campos et al. 2011, Maltby and Acreman 2011).

Examining the water levels at different time periods throughout the study across a linear transect profile provides insight regarding hydrologic connectivity between the wetland and the canal. Although this is not an ideal representation due to the wells installed by SSES not being located in a relatively straight line and shortest distance from the wetland to the canal, their projected data provides a reasonable picture of site hydrology. This includes soil profile data submitted by SES which depicts each well location to contain surface sands of varying thickness underlain by a clayey soil layer that is likely to slow the downward movement of water. Figures 5-6 depict water levels at four intervals and suggests a continuous hydrologic connection exists between the wetland and the canal through the shallow sandy soil layer and as overland flow across the uplands during the hurricane.

ERP Basis of Review Calculations:

It is not clear how the varying gradients were calculated by SSES. A detailed description of the procedure utilized, source of input data, depiction of calculations, and adequate documentation would be necessary for a thorough evaluation. Regardless, this procedure is not a definitive determination for documenting a hydrologic connection. Based on a rough conservative estimate utilizing procedures from the South Florida Water Management District Basis of Review, inputs of 48.53 (edge of wetland elevation) minus 47.22 (elevation at canal) divided by 230 (shortest distance from wetland to canal) equal a gradient of 0.0057. This value according to the SSES report is a gradient that may cause wetland draining from drawdown and contradictory to their findings.

Figure 5. Water Level Diagram Depicting Depicting The Water Table On 8-31-2017 and 9-5-2017.

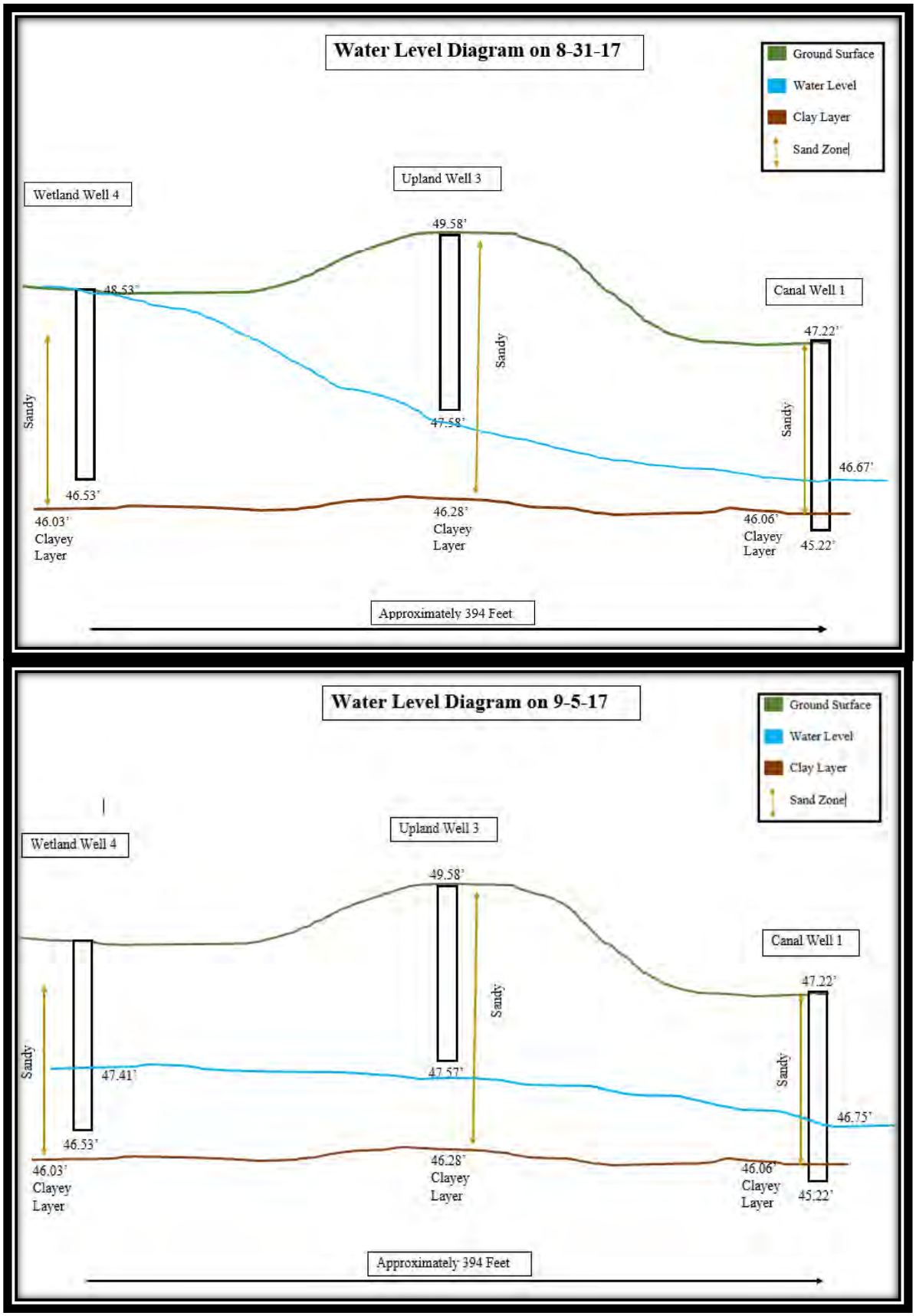
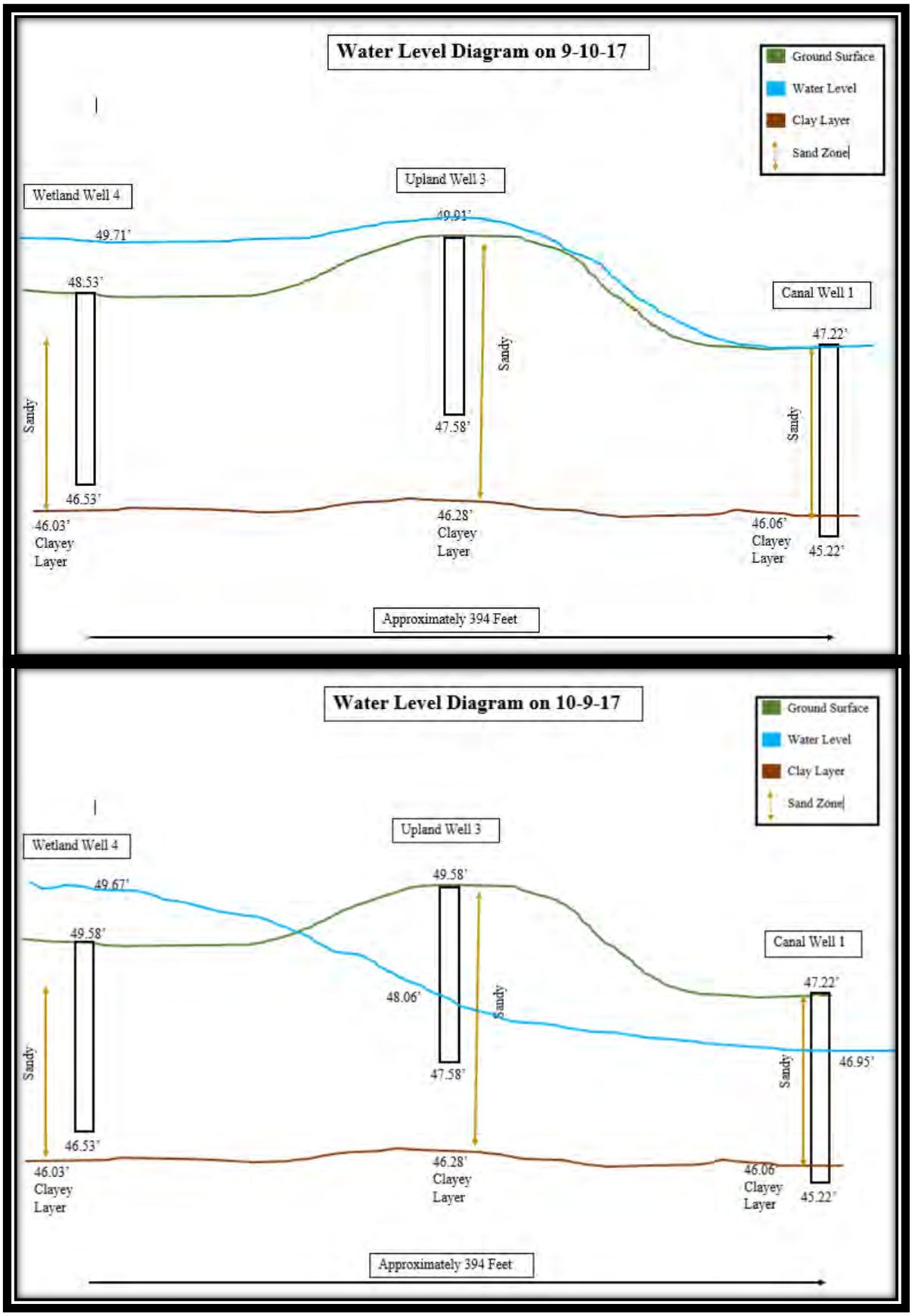


Figure 6. Water Level Diagram Depicting Depicting The Water Table On 9-10-2017 and 10-9-2017.



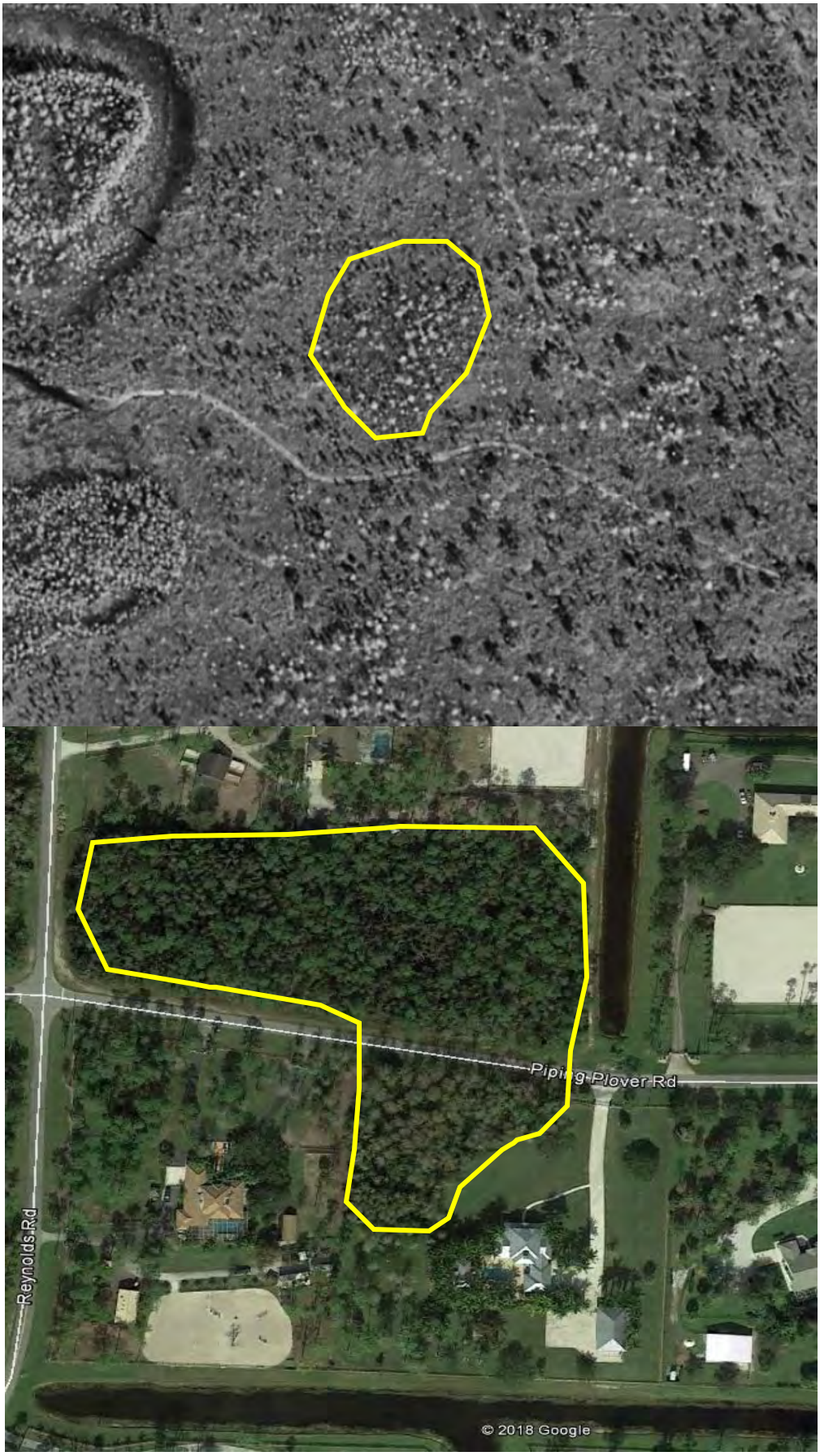
Additional Jurisdictional/Connectivity Considerations:

Prior to being bisected by Piping Plover Road, the on-site wetland was part of a larger wetland system. This depressional forested wetland is visible on historical aerial imagery and also on present day imagery existing on both the north and south side of Piping Plover Road (Figure 7). A canal is present on the north side of the road and appears to be separated from that portion of the off-site wetland by a berm less than 20 feet wide. The on-site portion of the wetland is approximately 150 feet from the canal. The soil survey depicts this whole area to consist of Pineda soils which have rapid permeability and high hydraulic conductivity. It is very likely that a shallow subsurface connection to the canal also exists in this location based on soils and general proximity. The general proximity alone would suggest the potential for ecological interconnectivity between the wetland and the canal. According to the findings in EPA Memorandum To Re-Evaluate Jurisdiction For NWP-2007-428 (Attachment B), the presence of Piping Plover Road does not necessarily prevent the off-site wetland to the north and the on-site wetland from functioning as one wetland as it historically did. Taking this into consideration, an adjacency determination can be made from the wetland as a whole (on and off-site portions) in relation to the berm that separates it from the canal. In addition, the USACE Jurisdictional Determination Form Instructional Guidebook (2007), indicates that wetlands separated from other waters of the U.S. by man-made dikes or barriers, natural river berms, beach dunes, and the like are adjacent. Based on this guidance, the on-site wetland would be adjacent to the canal on the north side of Piping Plover Road as it is separated by a man-made barrier.

Conclusion:

Based on soil survey data and the report submitted by SSES, a continuous hydrologic connection exists between the wetland and the canal through the shallow sandy soil layer. The water levels fluctuate appropriately based on precipitation events and displayed an overland flow across the uplands connection to the canal during the hurricane. Additionally, wetland jurisdiction through adjacency is supported by proximity and a likely ecological interconnectivity.

Figure 7. 1968 and 2017 Aerial Images Of Historical And Present Day Wetlands In Yellow.



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Attachment A

ISOLATED WETLAND STUDY

Homeland Lot #132, 11534 Piping Plover Lane, Wellington, Florida

The purpose of this study was to determine the likelihood of a biological, chemical or physical connection, either surface or groundwater, between the wetland in the northwestern part of the lot and a canal which runs along the southern border of the lot. The information below is provided for a Section 404 Clean Water Act analysis to test if a significant nexus is present between what will be shown to be an isolated wetland and an interior canal in the Homeland Subdivision that flows into the Lake Worth Drainage District E1-Canal.

Study Area and Methods

The study area is a single-family home, Figure 1, where the owners wish to build a barn and additional equestrian facilities on their lot. During the permitting process a Jurisdictional Wetland Determination was requested and there was a question as to the possible connection between the northern wetland, 1.1 acres in size, and a southern flood control canal.

Figure 1. Homeland Lot #132, 11534 Piping Plover Lane, Wellington, Florida.

Water Table Wells

Four (4) water table wells and a recording rain gauge were installed on August 5, 2017 on Homeland Lot #132, 11534 Piping Plover Lane, Wellington, Florida. See photos in Appendix 1. The wells, Infinities USA, Inc. model #138 Pressure Water Level Data Loggers, were calibrated before installation and installed according to Sprecher, S.W., 2008, Installing Monitoring Wells in Soils. National Soil Survey Center, USDA Natural Resources Conservation Service, Lincoln, NE. The wells were set at an offset depth of 24-inches below ground surface. The wells were set up to record one water table level every 24 hours. One well, Well #1, was installed on the edge of a canal which runs along the southern property boundary. Well #3 was installed in the upland portion of the lot located between the canal and the wetland. Two wells were installed in the wetland, Well #4 near the west property line and Well #2 to the northeast of Well #4. The rain gauge was installed along the canal just west of Well #1 (Figure 2).

Figure 2. Location map of wells and rain gauge.

After the wells were installed, GT Surveyor Services of West Palm Beach surveyed the elevations of the wells on August 30th 2017. Relative elevations were based on an assumed 50-foot elevation in the center of Piping Plover Lane. Ground elevations for the wells were based on this bench mark. Information from the wells was downloaded in the field onto a Dell Inspiron 15-5000 Series laptop

computer during the August to October, 2017 study period. The water table heights were measured for ground-truthing. The data were subsequently graphed to show the water table levels and for ease of interpretation.

The survey data showed the lowest elevation for Well #1 at the canal with elevation 47.22 feet. Well #3 in the uplands is the highest elevation at 49.58 feet, and the two wetland wells, Well #4 in the west and Well #2 in the east are both 48.53 feet. Figure 3 is a graph showing the relative land elevations at the wells.

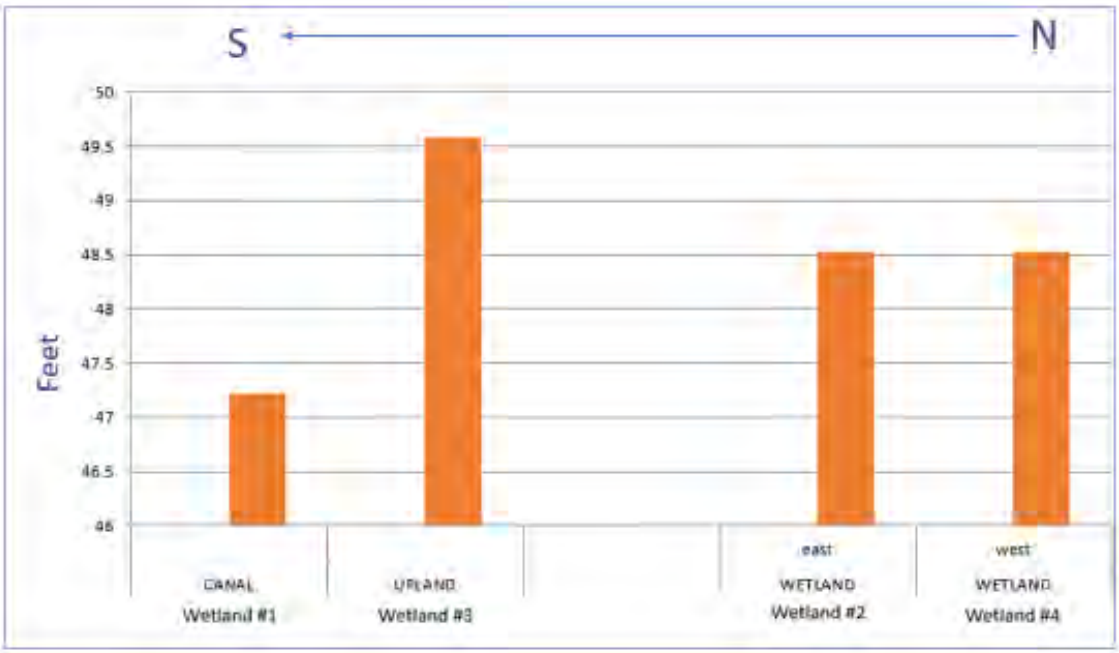


Figure 3. Graph of relative land elevations at the wells.

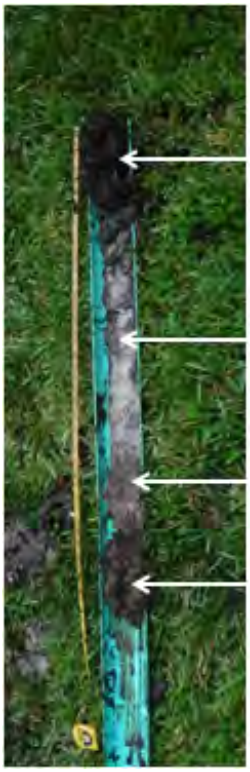
Soils

Soils were mapped by the USDA NRCS as Boca fine sand in the upland areas and dominated by Pineda fine sand in the depression. Both soils formed in sandy and loamy marine sediments. Pineda soils have loamy subsoil layers and very slow permeability. Boca soils are shallower, with 20 to 40-inches of sand and loamy subsoil deposited over paralithic limestone bedrock. The fractured limestone bedrock in the uplands has moderately high to high capacity to transmit water.

On-site soil investigations were conducted for preparation of sampling point data sheets previously submitted for hydric soil identification. Deeper borings were taken in the wetlands, upland well location and canal to characterize subsoil features and soil permeability and presented below.

In the wetland area, loamy organic soils with muck and mucky loam and sandy clay loam on the surface were found, which restricts the downward movement of water (Figure 4). These slowly permeable layers were slightly sticky and plastic with fine subangular blocky to massive soil structure. Thickness ranged from 2 to 8-inches and overlaid sandy subsuface layers. Soil borings at the eastern wetland water table well (Well #2) had 8-inches of black mucky loam over sandy subsoil. A restrictive layer with sandy clay loam texture was found from 36 to 42-inches below ground surface (Figure 5).

Figure 4. Loamy organic soils in wetland.



- A 0-8" (10YR 2/1) mucky loam, massive
- E1 8-30" (10YR 8/1) sand
- E2 30-36" (10YR 6/1) sand
- Bt 30-36" (10YR 3/3) sandy clay loam

Figure 5. Wetland soil profile at Well #1.

Soil in the upland area, between the wetland depression and the canal, had sandy surface layers consisting of coarse textured permeable fill material over sandy subsoil with or without thin loamy layers over mixed weathered and soft limestone that can be dug with a spade. Areas of limestone bedrock were observed on bare ground along the tree lines. Depth to coarse weathered limestone ranged from 16 to 42-inches below ground surface in the uplands south and southwest of the wetland depression (see figure 6).

- A1 0-6" mixed (10YR 4/1, 10YR 3./1) sand
- A2 6-12" (10YR 6/3) sand w/ limestone fragments
- E1 12-18" mixed (10YR 4/2, 4/2) sand
- E2 18-24" (10YR 6/3, 10YR 7/2) sand; stripped matrix
- E3 24-36" (10YR 7/1, 8/1) sand
- BE 36-40" (10YR 4/3) sandy loam
- Bt 40-42" (10YR 4/3) sandy clay loam
- BC 42-48" (10YR6/4) coarse sand
- CR 48-50+ (10YR8/1) sand & limestone

Figure 6. Upland soil profile.

Soils were also examined closer to the canal, between the fence line and water table well (Well #1). They were mixed sandy soils with limestone fragments in the upper 10-inches of the soil surface. The subsurface had a reduced gleyed sandy matrix about 4-inches thick over a slowly permeable sandy clay loam (marl) layer about 16-inches thick over weathered limestone.

Results

The rainfall data were examined and storms greater than 0.50 inches are discussed. There were nine (9) storms greater than 0.50 inches; Storm #1 on August 10th and 11th was 1.71 inches, Storm #2 on August 24th and 25th was 1.10 inches, Storm #3 on August 28th for 0.64 inches, Storm #4 on September 6th for 1.54 inches, Storm #5 on September 9th and 10th for 6.26 inches which was Hurricane Irma, Storm #6 on September 22nd and 23rd for 1.71 inches, Storm #7 on September 29th and 30th for 1.74 inches, Storm #8 on October 2nd for 0.66 inches and Storm #9 on October 4th and 5th 2017 for 1.58 inches. Storms #8 and #9 were part of a tropical depression. The total rainfall for the study period from August 2nd 2017 through October 11th 2017 was 19.84 inches accounting for over a third of the average yearly rainfall for the area. The total included storms less than 0.50 inches that are not discussed individually. Below (Figure 7) is a graph that shows both the individual storms and the cumulative rainfall for the study period. All rainfall data is presented in Appendix 2.

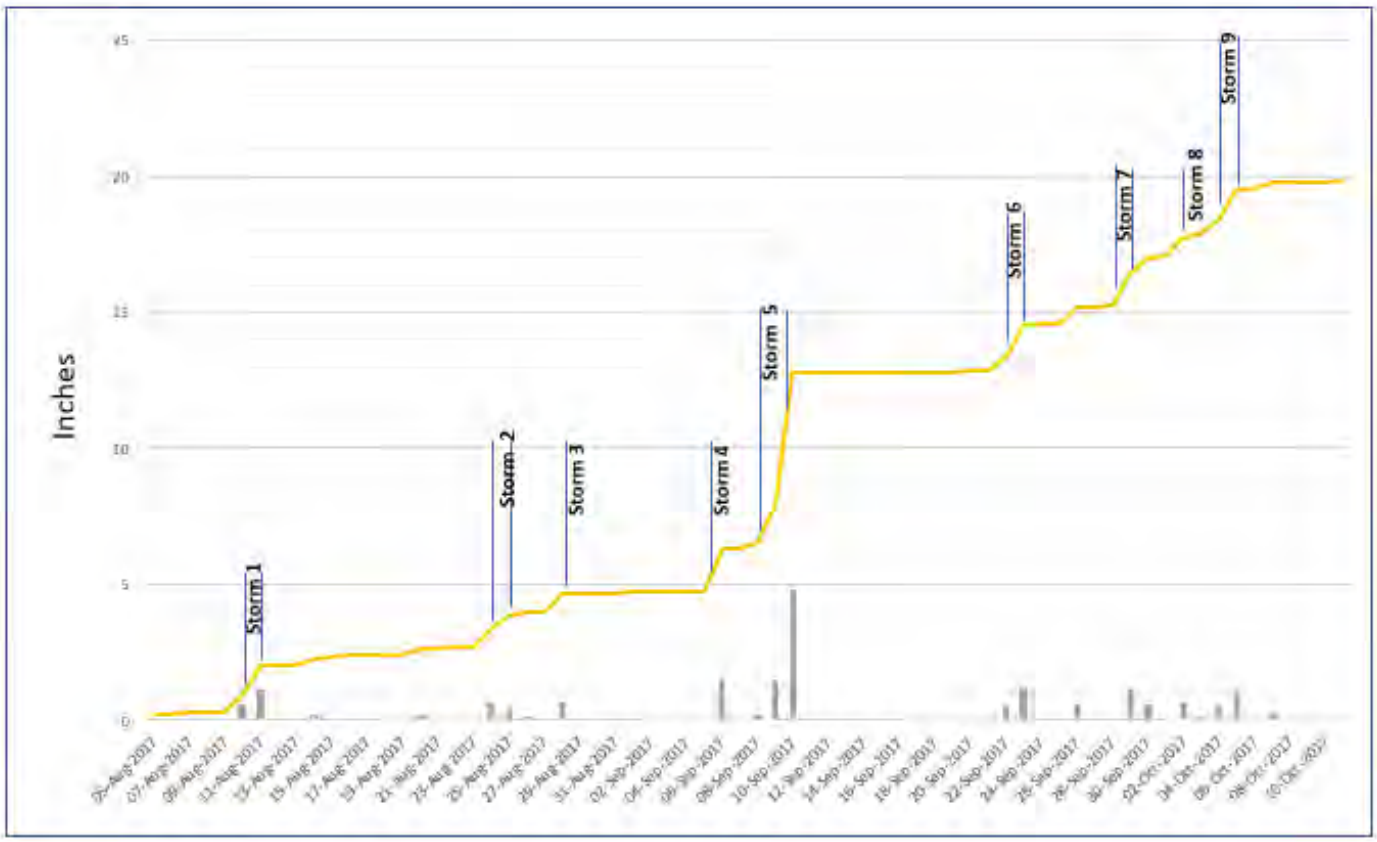


Figure 7. Individual storms and cumulative rainfall for the study period.

The canal water table well (Well #1) was placed a few feet upslope of the water edge during installation. Water table in the canal responded to the storms only slightly as the interior canals are held back by a weir which outfalls to the Lake Worth Drainage District Canal E-1 that slowly bleed down at a rate of 1-inch in 24 hours to prevent flooding.

The data from Storm #1 was not recorded due to equipment startup. Storms #2 through #4 had less than 2 inches water table fluctuation in the canal. Storm #5, Hurricane Irma, spiked the canal water table over a 23-inch after 6.26 inches of rainfall. Storms #2 through #4 and Storms #6, #7 and #9 did not result in any water near the top of the canal bank. Storms #5 did have water near the top shoulder of bank for four or five days and Storm #8 for one day. Water table data are present in Appendix 3.

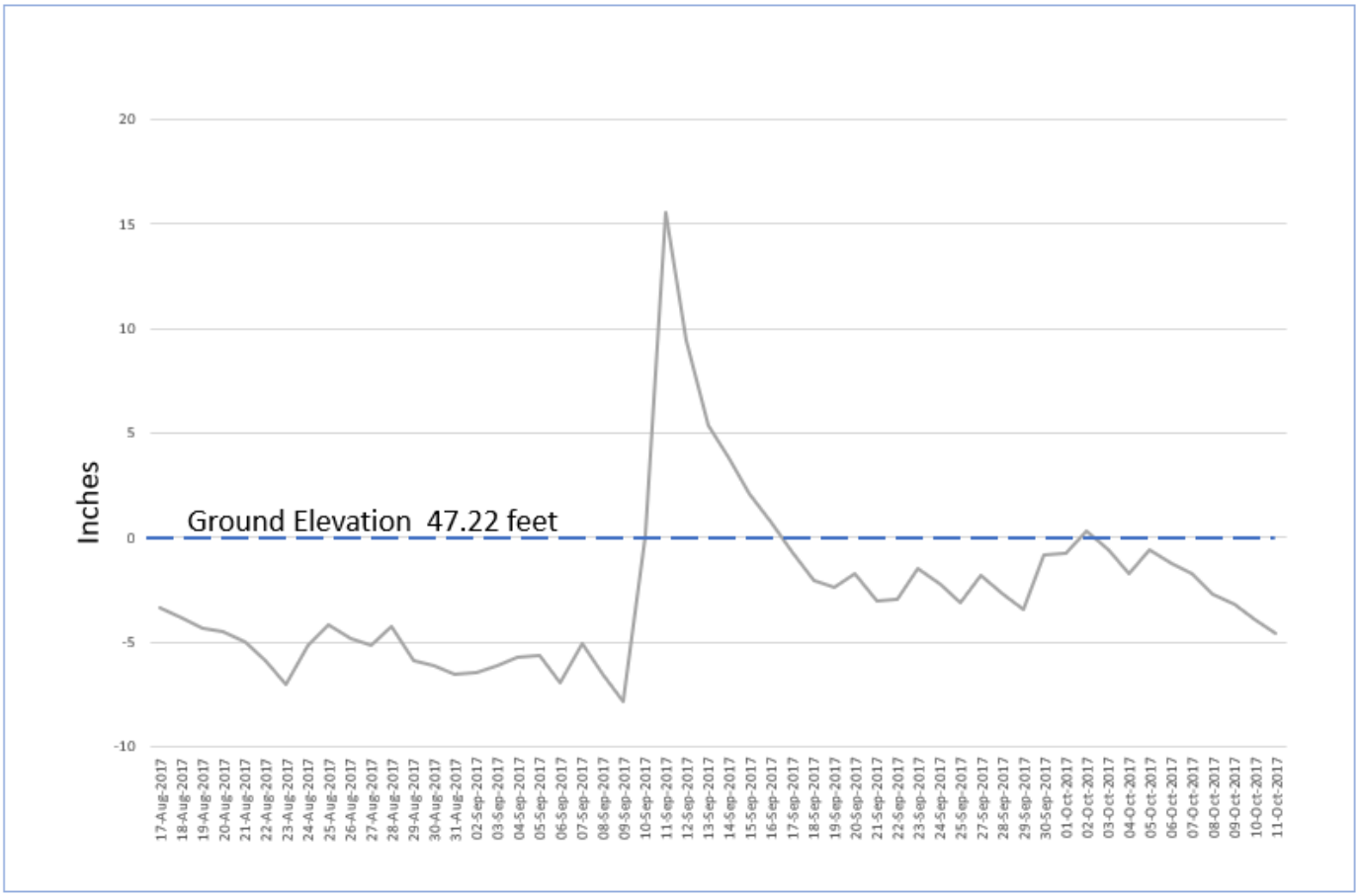


Figure 8. Water Table Well #1 (canal) groundwater monitoring results.

In contrast to the canal, the water table in the uplands, Well #3, rose quickly in response to rainfall events and water moved rapidly through the soil. Before and after each storm up to Hurricane Irma, Storm #5, the water table dropped to or below the 24-inch well depth. During Storm #1 (August 10th and 11$^{th)}$, the water table rose 16.31 inches or more within 48 hours then dropped more than 10-inches by the next day's recording. There was little or no change in the water table during Storms #2, #3, or #4, August 24th through September 6th. Well #3, showed no water ponded on the surface during any storms except during Hurricane Irma. The water table rose quickly above ground surface when the data points were taken during the two-day storm. Data points were taken once every 24 hours. The water table then dropped to 10.19 inches below ground surface within 48 hours after the storm. With 12.83 inches of cumulative rainfall up to Hurricane Irma, the water table rose again over 12-inches during the 2-day Storm #6 event, September 22nd and 23rd then dropped 9.64 inches within

48 hours. During Storm #7 (September 29th and 30th), the water table rose 11.78 inches. and another 8.83 inches 2 days later with Storm #8 before dropping down almost 13-inches. During the tropical depression Storms #8 and #9 the water table rose quickly on October 2nd and October 5th dropping quickly after each event.

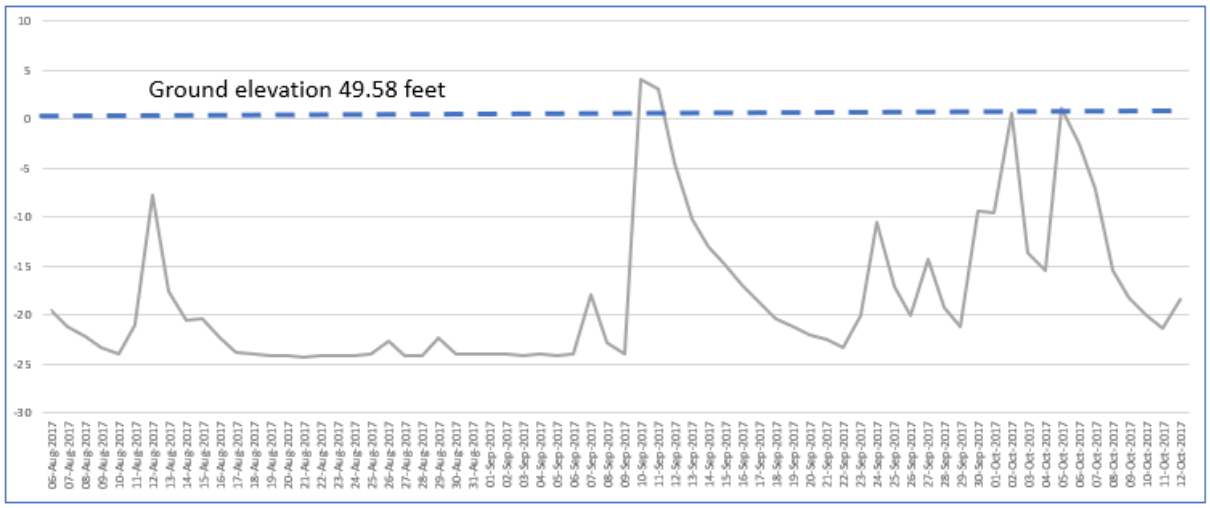


Figure 9. Water Table Well #3 (upland) storm response.

The two wetland wells closely mimicked each other responding somewhat differently in contributing area inputs such as adjacent slope and proximity to the wetland edge. Well #2 began to malfunction during a dry period between Storm #3 and Storm #4, August 28th to September 6th. There were 9 days with less than 0.1 inch of rainfall recorded. During this time, both wetland wells were at their lowest point. Well #2 dropped to less than 5 inches below ground surface and Well #4 more than 13 inches. During this dry period, Well #2 became inconsistent and began to vary greatly from the ground truthing during the downloading of the well data. Both wetland wells quickly held water again after Hurricane Irma and continued to be above ground surface for the rest of the study. Although there was only 0.05 inch of rain in the 11 days after Hurricane Irma the wetland wells continued to stack water as shown in Figure 10, in comparison to the uplands and lowering of the canal.

Figure 10. Wetland Water Table Wells #2 and #4 storm response.

Discussion

The purpose of this study was to determine the likelihood of a biological, chemical or physical connection, either surface or groundwater, between the wetland in the northwestern part of the lot and a canal which runs along the southern border of the lot.

The 5-acre parcel includes a single-family residential home with a multi-car garage, driveway and landscaped fenced property. The house was built up on fill material high above the wetland. The property is being redesigned for equestrian use typical of the neighborhood, to include a barn, paddocks and other facilities.

The biological and chemical components of a natural Florida landscape have been interrupted by grass lawn, sandy fill, and other landscaping. The canal bank has compacted mixed fill material itself with areas of bare ground and weedy vegetation and is maintained by mowing. The wetland has been cut off from natural inflow by Piping Plover Lane to the north, a paved driveway to the east, and on the west, a hard packed, unpaved driveway along the property line, which has been filled to the level of Piping Plover Lane, beyond which is the neighbor's barn and equestrian facilities as shown in Appendix 1. Water in the wetland is artificially re-charged from the surrounding development and storm driven with duration and frequency that does not reflect natural soil conditions or native communities. Outflow is limited, controlled by evaporation and transpiration and slow percolation. There is no surface or apparent subsurface connection to the canal as shown in the data and field investigations.

The wetland itself has two fairly dense mixed canopy layers and a very dense understory and shrub layer dominated by invasive non-native vegetation. The dense habitat is undesirable for any wading bird activity and is limited as an aquatic resource as it is subject to irregular ponding and drying cycles and also due to its isolation. No listed species were observed during site visits. Wildlife activity during numerous site visits was rarely notable. Wetland photos are shown in the Appendix 1 and listed in the original data sheet submittal.

The survey data clearly showed no physical surface connection between the wetland and the canal. There is approximately 230 feet upland separation distance between the wetland and the canal. The upland well was surveyed to be more than 2 feet higher than the canal, but the upland topography varies greatly across the yard with some areas much higher surrounding the residence and landscaping between the wetland and canal. The wetland sits over a foot higher than the canal and more than a foot lower than the upland well location.

The upland well, Well #3, was placed about 30-feet from the wetland edge in an area of bare ground along the fence line to avoid site disturbance. The well elevation was a few inches lower than the surrounding lawn. Examination of the upland groundwater table showed quick flashy responses to the storms in the permeable surface soils above fractured limestone.

There was a gradual, very slow and very small response to the storms in the wetlands. Both wetland wells perched water above surface for most of the study. The largest drop in the wetland water table was 13 inches during an extended dry period at the beginning of September before Hurricane Irma between Storms #3 and #4, which took 8 days due to the slow infiltration rates in the soil.

The canal showed a negative downward trend in water table elevation for flood control, while there was a positive upward trend in the wetlands water table from rainfall events and adjacent contributing areas. The wetlands are not connected horizontally to the canal by subsurface drainage and perch above the restrictive soil layers. Soil borings showed restriction to the downward movement of water

in the wetlands, permeable soils in the uplands with shallow fractured limestone, and restrictive marl soil adjacent to the canal. Any horizontal movement above the shoulder of the wetland depression was not evident and horizontal movement would continue vertically once it hit the sandy soils of the uplands. No positive surface water outflow or hydrologic connection between the wetland and canal were found.

While not solely determining significant nexus on a specific threshold distance, calculations were made to evaluate the potential effects on canal drawdown to the wetlands. Based on soil type and distance to the canal, gradient criteria calculations common to ERP permitting were applied. Using USDA and SFWMD calculations in the Basis of Review, a gradient criterion of 0.005, 1 foot per 200-foot distance, is standard for sandy soils. It is a standard in ERP permitting that that a gradient above 0.005 may cause wetland draining from drawdown. A calculation below 0.005 is anticipated to have no effect on wetlands at a specific distance from the canal and associated control elevation. Based on this survey, a gradient of 0.004 (< 0.005) was found during the entire study period August 17 to October 10 which included Hurricane Irma. Under more normal rainfall before the hurricane, August 17th to September 8th, an even lower gradient of 0.002 was calculated. This indicates no anticipated effect of canal drainage on the isolated wetland on the property which supports the water table well monitoring study.

Conclusion

The field review determination conducted July 6th, 2017 (Wagner, SAJ-2017-01506 (JD-CF) totaling 1.1 acres represents the upland/wetland boundary for the purposes of determining the Corps jurisdictional line. *The project wetlands have no connectivity* with the nearby canal and no measurable or definable effect on the physical, chemical, and/or biological integrity of the canal. As depicted in the exhibits drawings and Figure #2 above the property encompasses an isolated wetland which is not waters of the United States and therefore are not subject to regulation by the Corp.

Limitations:

While due care has been exercised in the performance of these measurements and their interpretations, Southeast Soil & Environmental Service, Inc. can make no representations, warranties, or guarantees with respect to latent or concealed conditions which may exist that may be beyond the limits of the detection with the methodologies used.

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Gregory J. Sawka, CPSS . 02625

Appendix 1.

Photo Exhibit

Appendix 2.

Rainfall Data

Appendix 3.

Water Table Well Data

Appendix 4.

Survey

Appendix 2.

Rainfall Data

User Name R1 RAINFALL

Data Acquired 12-Oct-2017 09:38:53

Serial Number N46B083F

Date dd-mmm-yyyy	Rainfall inches DAILY	CUM
02-Aug-2017	0.02	0.02
03-Aug-2017	0.06	0.08
04-Aug-2017	0.02	0.1
05-Aug-2017	0.1	0.2
06-Aug-2017	0	0.2
07-Aug-2017	0.09	0.29
08-Aug-2017	0	0.29
09-Aug-2017	0.02	0.31
10-Aug-2017	0.57	0.88
11-Aug-2017	1.14	2.02
12-Aug-2017	0.01	2.03
13-Aug-2017	0	2.03
14-Aug-2017	0.25	2.28
15-Aug-2017	0.06	2.34
16-Aug-2017	0.04	2.38
17-Aug-2017	0	2.38
18-Aug-2017	0	2.38
19-Aug-2017	0.01	2.39
20-Aug-2017	0.25	2.64
21-Aug-2017	0.01	2.65
22-Aug-2017	0.08	2.73
23-Aug-2017	0	2.73
24-Aug-2017	0.65	3.38
25-Aug-2017	0.45	3.83
26-Aug-2017	0.13	3.96
27-Aug-2017	0.05	4.01
28-Aug-2017	0.64	4.65
29-Aug-2017	0	4.65
30-Aug-2017	0	4.65
31-Aug-2017	0	4.65
01-Sep-2017	0.06	4.71
02-Sep-2017	0.03	4.74
03-Sep-2017	0	4.74
04-Sep-2017	0	4.74

05-Sep-2017	0	4.74
06-Sep-2017	1.54	6.28
07-Sep-2017	0	6.28
08-Sep-2017	0.24	6.52
09-Sep-2017	1.48	8
10-Sep-2017	4.78	12.78
11-Sep-2017	0	12.78
12-Sep-2017	0	12.78
13-Sep-2017	0	12.78
14-Sep-2017	0	12.78
15-Sep-2017	0	12.78
16-Sep-2017	0.02	12.8
17-Sep-2017	0	12.8
18-Sep-2017	0.01	12.81
19-Sep-2017	0	12.81
20-Sep-2017	0.02	12.83
21-Sep-2017	0	12.83
22-Sep-2017	0.55	13.38
23-Sep-2017	1.16	14.54
24-Sep-2017	0.05	14.59
25-Sep-2017	0	14.59
26-Sep-2017	0.63	15.22
27-Sep-2017	0	15.22
28-Sep-2017	0.05	15.27
29-Sep-2017	1.11	16.38
30-Sep-2017	0.63	17.01
01-Oct-2017	0.08	17.09
02-Oct-2017	0.66	17.75
03-Oct-2017	0.14	17.89
04-Oct-2017	0.53	18.42
05-Oct-2017	1.05	19.47
06-Oct-2017	0.07	19.54
07-Oct-2017	0.27	19.81
08-Oct-2017	0	19.81
09-Oct-2017	0	19.81
10-Oct-2017	0	19.81
11-Oct-2017	0.03	19.84

Appendix 3.

Water table Data

User Name	W41GS2	Elevation(inches):	-24
Data Acquired	12-Oct-2017	10:12:38	
Serial Number	N47E1D81		

CANAL
WATER TABLE

Date dd-mmm-yyyy	Water Level inches
17-Aug-2017	-3.36
18-Aug-2017	-3.82
19-Aug-2017	-4.36
20-Aug-2017	-4.5
21-Aug-2017	-4.95
22-Aug-2017	-5.9
23-Aug-2017	-7
24-Aug-2017	-5.15
25-Aug-2017	-4.16
26-Aug-2017	-4.78
27-Aug-2017	-5.14
28-Aug-2017	-4.27
29-Aug-2017	-5.86
30-Aug-2017	-6.09
31-Aug-2017	-6.55
02-Sep-2017	-6.43
03-Sep-2017	-6.15
04-Sep-2017	-5.69
05-Sep-2017	-5.59
06-Sep-2017	-6.94
07-Sep-2017	-5.02
08-Sep-2017	-6.53
09-Sep-2017	-7.81
10-Sep-2017	0.09
11-Sep-2017	15.52
12-Sep-2017	9.46
13-Sep-2017	5.35
14-Sep-2017	3.83
15-Sep-2017	2.1
16-Sep-2017	0.75
17-Sep-2017	-0.66
18-Sep-2017	-2.06
19-Sep-2017	-2.33
20-Sep-2017	-1.74
21-Sep-2017	-3
22-Sep-2017	-2.96

23-Sep-2017	-1.45
24-Sep-2017	-2.17
25-Sep-2017	-3.14
27-Sep-2017	-1.84
28-Sep-2017	-2.73
29-Sep-2017	-3.42
30-Sep-2017	-0.83
01-Oct-2017	-0.77
02-Oct-2017	0.3
03-Oct-2017	-0.55
04-Oct-2017	-1.74
05-Oct-2017	-0.55
06-Oct-2017	-1.21
07-Oct-2017	-1.75
08-Oct-2017	-2.68
09-Oct-2017	-3.15
10-Oct-2017	-3.93
11-Oct-2017	-4.61

User Name GS14 Elevation(inches): -24 UPLAND
Data Acquired 12-Oct-2017 09:36:28

Serial Number N47E1D5D

Date dd-mmm-yyyy	Water Level inches
06-Aug-2017	-19.53
07-Aug-2017	-21.22
08-Aug-2017	-22.19
09-Aug-2017	-23.38
10-Aug-2017	-24.01
11-Aug-2017	-21.07
12-Aug-2017	-7.7
13-Aug-2017	-17.55
14-Aug-2017	-20.5
15-Aug-2017	-20.38
16-Aug-2017	-22.4
17-Aug-2017	-23.74
18-Aug-2017	-23.99
19-Aug-2017	-24.08
20-Aug-2017	-24.1
21-Aug-2017	-24.27
22-Aug-2017	-24.16
23-Aug-2017	-24.15
24-Aug-2017	-24.18
25-Aug-2017	-24
26-Aug-2017	-22.66
27-Aug-2017	-24.09
28-Aug-2017	-24.09
29-Aug-2017	-22.27
30-Aug-2017	-24.04
31-Aug-2017	-24.04
01-Sep-2017	-24.03
02-Sep-2017	-24
03-Sep-2017	-24.08
04-Sep-2017	-24.05
05-Sep-2017	-24.07
06-Sep-2017	-24.02

07-Sep-2017	-17.98	UPLAND
08-Sep-2017	-22.82	
09-Sep-2017	-23.95	
10-Sep-2017	4.04	
11-Sep-2017	3.04	
12-Sep-2017	-4.42	
13-Sep-2017	-10.19	
14-Sep-2017	-12.94	
15-Sep-2017	-15.03	
16-Sep-2017	-16.98	
17-Sep-2017	-18.78	
18-Sep-2017	-20.3	
19-Sep-2017	-21.26	
20-Sep-2017	-21.96	
21-Sep-2017	-22.53	
22-Sep-2017	-23.4	
23-Sep-2017	-20.08	
24-Sep-2017	-10.48	
25-Sep-2017	-17.04	
26-Sep-2017	-20.12	
27-Sep-2017	-14.24	
28-Sep-2017	-19.21	
29-Sep-2017	-21.14	
30-Sep-2017	-9.36	
01-Oct-2017	-9.52	
02-Oct-2017	0.69	
03-Oct-2017	-13.59	
04-Oct-2017	-15.49	
05-Oct-2017	1.13	
06-Oct-2017	-2.48	
07-Oct-2017	-7.06	
08-Oct-2017	-15.38	
09-Oct-2017	-18.19	
10-Oct-2017	-20.09	
11-Oct-2017	-21.32	
12-Oct-2017	-18.45	

User Name	W19GS1	Elevation(inches):	-24	WETLAND
Data Acquired	12-Oct-2017	10:21:57	+3 field offset	West
Serial Number	N47D9EB3			

Date dd-mmm-yyyy	Water Level inches
05-Aug-2017	W-WETLAND
06-Aug-2017	7.24
07-Aug-2017	6.36
08-Aug-2017	6.47
09-Aug-2017	5.44
10-Aug-2017	5.42
11-Aug-2017	5.16
12-Aug-2017	7.19
13-Aug-2017	6.99
14-Aug-2017	6.97
15-Aug-2017	6.79
16-Aug-2017	6.29
17-Aug-2017	5.7
18-Aug-2017	5.14
19-Aug-2017	4.53
20-Aug-2017	4.42
21-Aug-2017	3.79
22-Aug-2017	3.19
23-Aug-2017	2.52
24-Aug-2017	2.94
25-Aug-2017	3.1
26-Aug-2017	2.78
27-Aug-2017	2.16
28-Aug-2017	1.45
29-Aug-2017	1.98
30-Aug-2017	1.23
31-Aug-2017	0.02
01-Sep-2017	-3.16
02-Sep-2017	-7.28
03-Sep-2017	-10.83
04-Sep-2017	-12.68
05-Sep-2017	-13.44
06-Sep-2017	1.03

07-Sep-2017	-0.13	WETLAND
08-Sep-2017	-0.53	West
09-Sep-2017	-1.31	
10-Sep-2017	14.2	
11-Sep-2017	15.55	
12-Sep-2017	15.19	
13-Sep-2017	14.82	
14-Sep-2017	14.44	
15-Sep-2017	13.93	
16-Sep-2017	13.46	
17-Sep-2017	12.9	
18-Sep-2017	12.39	
19-Sep-2017	11.83	
20-Sep-2017	11.29	
21-Sep-2017	10.74	
22-Sep-2017	10.89	
23-Sep-2017	12.5	
24-Sep-2017	12.26	
25-Sep-2017	11.76	
26-Sep-2017	12.17	
27-Sep-2017	11.93	
28-Sep-2017	11.42	
29-Sep-2017	12.4	
30-Sep-2017	13.29	
01-Oct-2017	13.17	
02-Oct-2017	13.74	
03-Oct-2017	13.43	
04-Oct-2017	13.64	
05-Oct-2017	14.56	
06-Oct-2017	14.66	
07-Oct-2017	14.72	
08-Oct-2017	14.24	
09-Oct-2017	13.79	
10-Oct-2017	13.22	
11-Oct-2017	12.68	

User Name	GS18	Elevation(inches):	-24	WETLAND
Data Acquired	12-Oct-2017	10:28:44		EAST

Serial Number N4DAEE87

Date	Water Level inches
	GS-18 E-wetland
06-Aug-2017	3.35
07-Aug-2017	2.79
08-Aug-2017	2.33
09-Aug-2017	1.7
10-Aug-2017	1.1
11-Aug-2017	1.55
12-Aug-2017	3.02
13-Aug-2017	2.63
14-Aug-2017	2.05
15-Aug-2017	1.87
16-Aug-2017	1.32
17-Aug-2017	0.83
18-Aug-2017	0.17
19-Aug-2017	-0.49
20-Aug-2017	-1.2
21-Aug-2017	-1.39
22-Aug-2017	-1.85
23-Aug-2017	-2.68
24-Aug-2017	-3.4
25-Aug-2017	-2.82
26-Aug-2017	-2.54
27-Aug-2017	-2.95
28-Aug-2017	-3.53
29-Aug-2017	-2.97
30-Aug-2017	-3.6
31-Aug-2017	-4.36
01-Sep-2017	error

Appendix 4.

Survey

INVOICE NO.: 67267

DATE:	DESCRIPTION:
09/23/2017	FIELD LOCATION OF IMPROVEMENTS

ABBREVIATIONS / SYMBOLS:

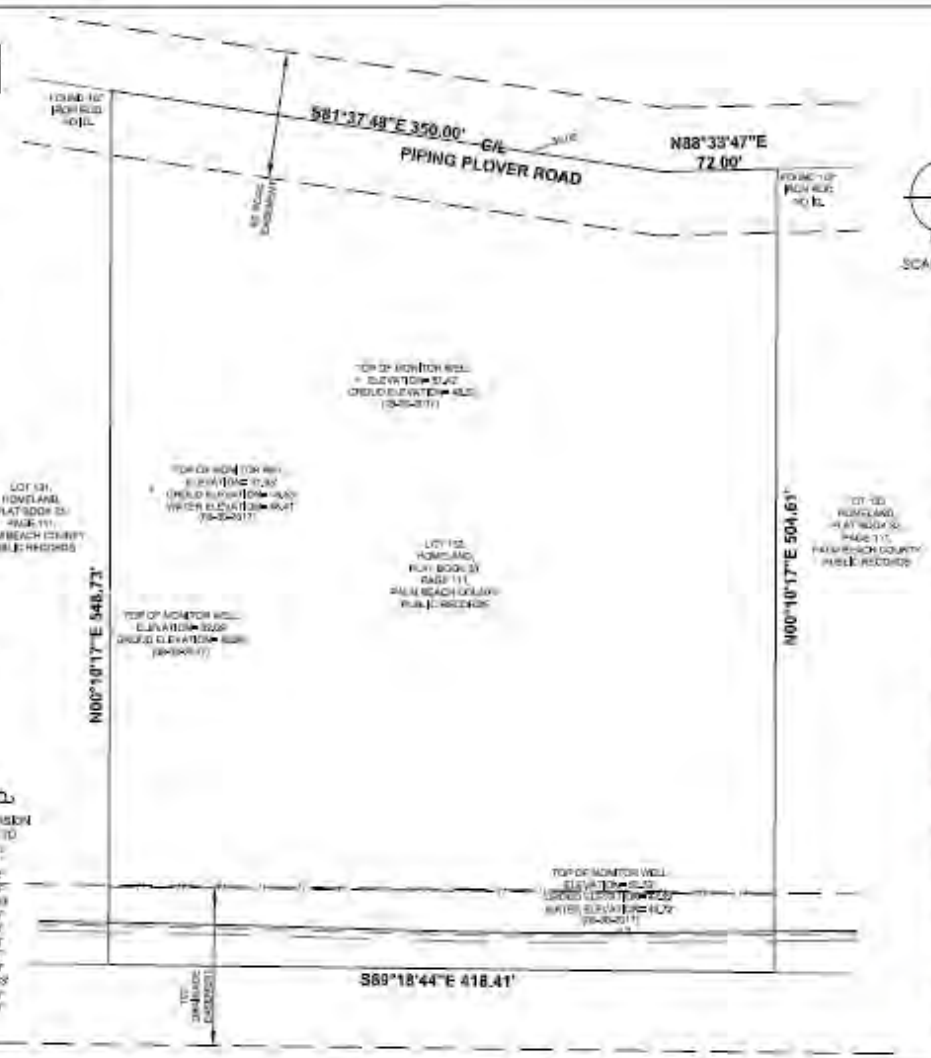
AC = AIR CONDITIONING UNIT
ABD = ABANDONED
ACR = ACCORD COUNTY RECORDS
BM = BENCHMARK
CALC = CALCULATED
CB = CONCRETE BLOCK
CB = CENTERLINE
CB = CATCH BASIN
CBW = CONCRETE BLOCK WALL
CHAT = CHAIN LINK FENCE
CONC = CONCRETE
CB = CONCRETE MONUMENT
DEL = DELTA
D = DEED
DE = DRAINAGE EASEMENT
DE = DRAINAGE STRUCTURE
ELEV = ELEVATION
EOW = EDGE OF WATER
FD = FOUND
FF = FINISHED FLOOR
FL = FLOW LINE
FN = FIRE HYDRANT
FP = IRON PIPE
FR = IRON ROD
GV = GATE VALVE
LME = LAKE MAINTENANCE EASEMENT
LP = LIGHT POLE
M = MEASURED
MC = MAILBOX CBG
ME = METALLIC ENCLAVE
NR = NON RADIAL
NTS = NOT TO SCALE
OHD = OVERHEAD CABLES
ORB = OFFICIAL RECORD BOOK
P = PLAT
PB = PLAT BOOK
PBCR = PALM BEACH COUNTY RECORDS
PC = POINT OF CURVATURE
PCC = POINT OF COMPOUND CURVATURE
PCP = PERMANENT CONTROL POINT
PG = PAGE
PI = POINT OF INTERSECTION
PCB = POINT OF BEGINNING
PCC = POINT OF COMMENCEMENT
PRC = POINT OF REVERSE CURVATURE
PRM = PERMANENT REFERENCE MONUMENT
PT = POINT OF TANGENCY
R = RADIUS
RBW = RAWW
ROW = RIGHT OF WAY
SEC = SECTION
SW = SIDEWALK
TOB = TOP OF BANK
TYP = TYPICAL
UE = UTILITY EASEMENT
W = WOOD FENCE
WPP = WOOD POWER POLE (NUMBER) POLE
TOL = TOTAL LENGTH

OVERHEAD CABLES
METAL FENCE
METAL FENCE
WOOD FENCE
PLASTIC FENCE
EASEMENT LINES
CENTERLINE (CL)

FIRE HYDRANT
WATER VALVE
UTILITY POLE
WATER METER

CONVERSION INCHES TO DECIMAL

1"	0.08'
2"	0.17'
3"	0.25'
4"	0.33'
5"	0.42'
6"	0.50'
7"	0.58'
8"	0.67'
9"	0.75'
10"	0.83'
11"	0.92'
12"	1.00'



SCALE: 1"=60'

SPECIAL PURPOSE SURVEY

(TO SHOW LOCATION/ELEVATION OF MONITOR WELLS)
PREPAIRED FOR:
GREGORY J. SAWKA

PROPERTY ADDRESS:

11534 PIPING PLOVER ROAD,
LAKE WORTH, FLORIDA 33449

LEGAL DESCRIPTION:

LOT 132, HOMELAND, ACCORDING TO THE MAP OR PLAT THEREOF AS RECORDED IN PLAT BOOK 33, PAGE 111, PUBLIC RECORDS OF PALM BEACH COUNTY, FLORIDA.

FLOOD DATA:

FLOOD ZONE: B
COMMUNITY NAME: UNINCORPORATED
COMMUNITY NUMBER: 120192
PANEL NUMBER: 0108

GT SURVEYOR SERVICES INC.
1005 SOUTHERN BLVD, UNIT 1
WEST PALM BEACH
FLORIDA 33406-1737
OFFICE: 561-753-0442
FAX: 561-753-0442
EMAIL: gtsurveyor@gmail.com

LICENSED SURVEYOR AND MAPPER

SIGNATURE
GREG TAYLOR, PROFESSIONAL SURVEYOR AND MAPPER
FLORIDA LICENSE NO. LS5146
NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF THE FLORIDA LICENSED SURVEYOR AND MAPPER NAMED ABOVE.

Attachment B

MEMORANDUM TO RE-EVALUATE JURISDICTION FOR NWP-2007-428

Summary

For JD# NWP-2007-428, the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers have determined that "wetland A" and "wetland B" are one wetland. The agencies are returning the JD to the district to re-evaluate whether wetland A/B is jurisdictional.

This determination is consistent with the Clean Water Act (CWA) and the agencies' regulations at 33 C.F.R. Parts 328.3 and 40 CFR 230.3. In making this determination, we have also utilized relevant case law and existing guidance, including the legal memorandum *Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States ("Rapanos Guidance")*, and the *JD Form Instructional Guidebook.*[1]

I. "Wetland A" and "Wetland B" Are One Wetland[2]

The JD site is located in Sherwood, Washington County, Oregon at 45.3657° North latitude and 122.8629° West longitude. "Wetland B" (0.28 acres) is separated by approximately 60 feet from "wetland A" (~1 acre) by a low, man-made berm. The berm was created over multiple years from plow patterns having pushed soil to the property boundary, and is believed to have been in place since approximately 1935. The two areas are functioning as one wetland, despite the presence of the berm.

Position in the landscape, similarities in plant communities and soils, and indicators of a shallow subsurface connection demonstrate that these two areas are in fact functioning as one wetland. They occupy the same swale that historically crossed the JD site from southwest to northeast.[3] "Wetland B" slopes from south to north toward "wetland A," with its north edge situated approximately 3.5 feet lower than its south end and one foot higher in elevation than "wetland A." "Wetland A," in turn, slopes down another 2.5 feet toward the drain tile located in its northeast corner. The area between "wetland A" and "wetland B" is dominated by hydrophytic vegetation, sharing several of

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[1] *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook* (June 5, 2007).

[2] The evidence included in this memorandum is a summary of the evidence considered by the agencies in reaching this conclusion. Additional information regarding the determination is contained in the administrative record for this action.

[3] Delineation Report, page 2. The swale is also evident on the topographic map of wetlands A and B (Figure 7a of the Delineation Report).

the same dominant species as found in wetland areas A and B. Wetland areas A and B, as well as the area between them, also occupy the same hydric soil unit—Huberly silt loam—as mapped by the Natural Resources Conservation Service (NRCS) and confirmed by the wetland delineation.[4] The NRCS describes these soils as occupying swales dissecting old alluvial terraces. Their 1982 Soil Survey of Washington County depicted the unnamed tributary extending upslope through and beyond the Huberly soil unit and wetland areas A and B.[5] That channel is no longer evident on the JD site and there were no indicators of a surface hydrologic connection between wetland areas B and A at the time of the wetland delineation.[6] However, the position of the wetland areas in the landscape, combined with the topography and soil at the site, provide indicators of a shallow subsurface connection between wetland areas B and A. These soils have a shallow water table at 0 to 18 inches, with a fragipan (i.e., dense, restrictive layer) at 20 to 30 inches below the surface. This soil structure, combined with the slope and topography, would direct movement of water from "wetland B" toward "wetland A." The proximity, landscape position, vegetation, soils and hydrologic conditions, all indicate that "wetland B" is functioning as one wetland with "wetland A," which we are identifying as "wetland A/B."

II. Jurisdictional Determination

The agencies are returning the JD to the district to re-evaluate whether wetland A/B is jurisdictional. Based upon new information provided by the Regional office, it appears that wetland A/B has a hydrologic connection to a different, more northern tributary as shown on the attached map.[7] The district should consider this information and re-evaluate whether wetland A/B is adjacent to the northern tributary. If the district determines that wetland A/B is adjacent, then it will need to conduct a significant nexus evaluation in relation to the Tualatin River, the nearest TNW, to determine if it is jurisdictional. The significant nexus evaluation should consider the flow and functions of the Cedar Creek tributary, along with the functions performed by wetland A/B, along with all other wetlands adjacent to the Cedar Creek tributary, to determine whether collectively they have a significant nexus to the chemical, physical and biological integrity of the Tualatin River.

---

[4] Ibid., Appendix B, Data Points A1 through A4 and B1 through B17. The data forms for the delineation indicate that the soils in the area between wetlands A and B were of the same hue (i.e., 7.5YR) and value (i.e., 3) as those at the nearby wetland data points, and differed from them by only one level of chroma (i.e., 3 vs. 2). Texture for all was characterized as either loam or silt loam.

[5] Ibid., Figure 6.

[6] As described on page 8 of the Delineation Report, the delineation of wetlands A and B occurred at a time well below normal precipitation (i.e., 0.25 inch versus the 3.46-inch average for the preceding three-week period).

[7] On February 19, 2008, Region 10 personnel confirmed during an on-site interview with the applicant's contractor that the clay drain tile associated with Wetland A/B conveyed flow in a different direction than originally described in the JD. The contractor confirmed the delineation consultant's description that, instead of draining from the southeast corner of Wetland A southeast toward Wetland D and the RPW it abuts, the pipe drained from the northeast corner of Wetland A to a different, more northerly tributary, as shown in the attached map. According to the delineation consultant, the northerly tributary flows at least three months per year; therefore, it appears that the tributary is also an RPW.

III. Conclusion

"Wetland A" and "Wetland B" are one wetland, and the presence of an artificial barrier (berm) does not sever the areas from functioning as one wetland. The agencies are returning the JD to the district to re-evaluate whether wetland A/B is jurisdictional.

Brian Frazer, Chief
Wetlands & Aquatic Resources Regulatory Branch
U.S. Environmental Protection Agency

Date: 25 Feb '08

David Olson, Regulatory Program Manager
Regulatory Community of Practice
U.S. Army Corps of Engineers

Date: 26 Feb 2008

Attachment for NWP-2007-428 Decision Memo

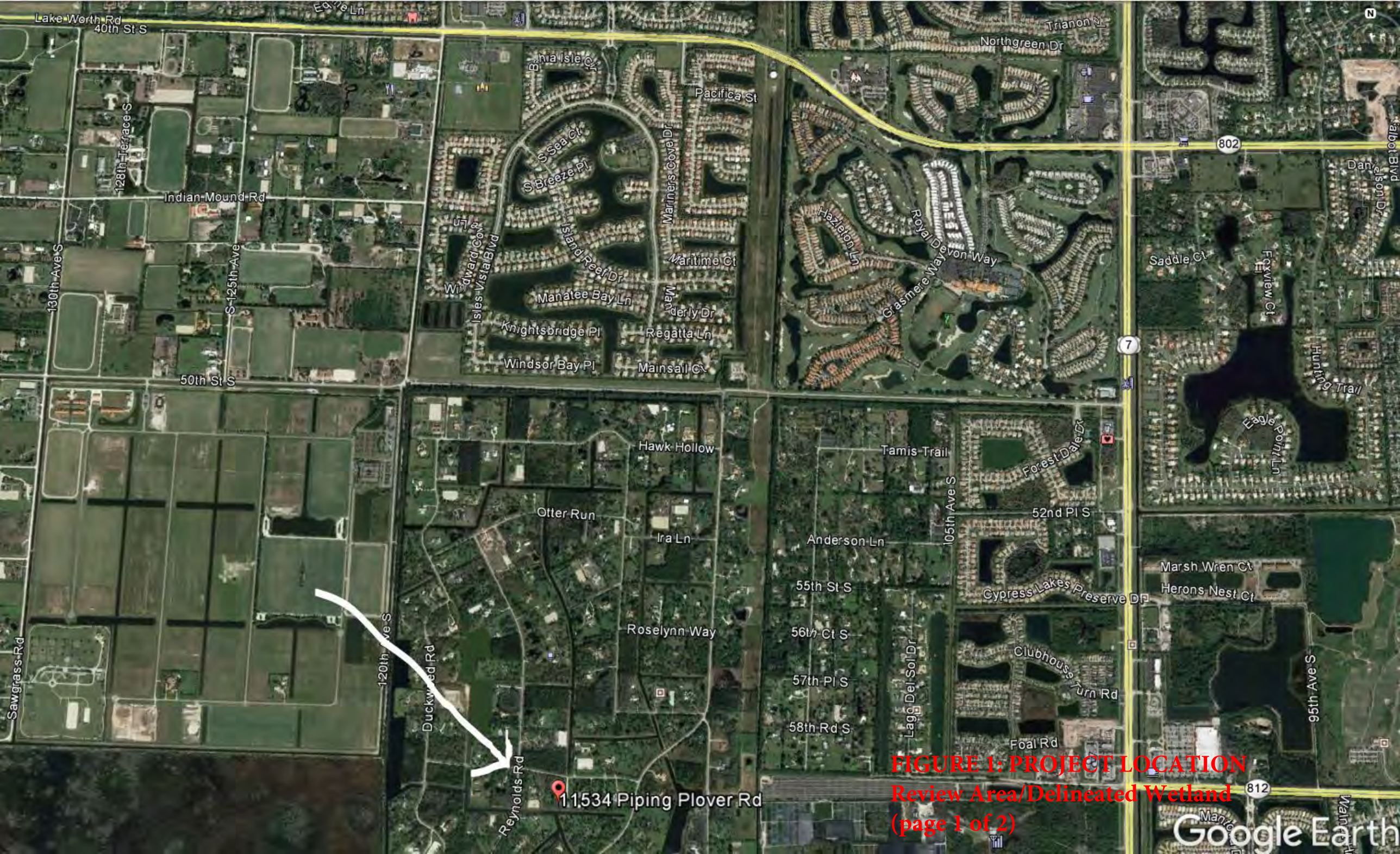

FIGURE 1: PROJECT LOCATION
Review Area/Delineated Wetland
(page 1 of 2)

11534 Piping Plover -Lot 132 Palm Beach Point, Wellington, FL

FIGURE 1: PROJECT LOCATION
Review Area/Delineated Wetland
(page 2 of 2)

Southeast
Soil & Environmental
Services, Inc.
772 359-0038
gsawka@juno.com

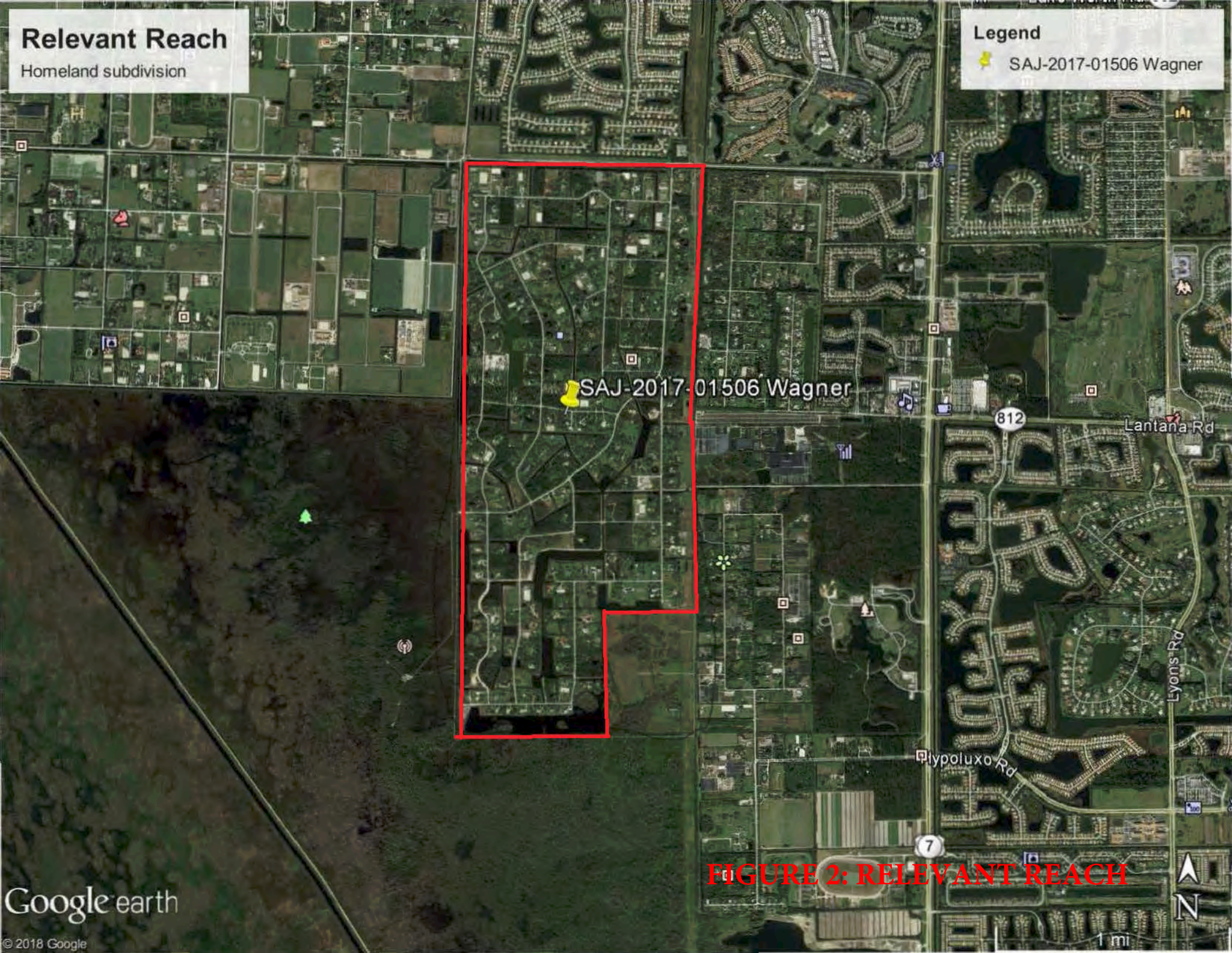

FIGURE 2: RELEVANT REACH

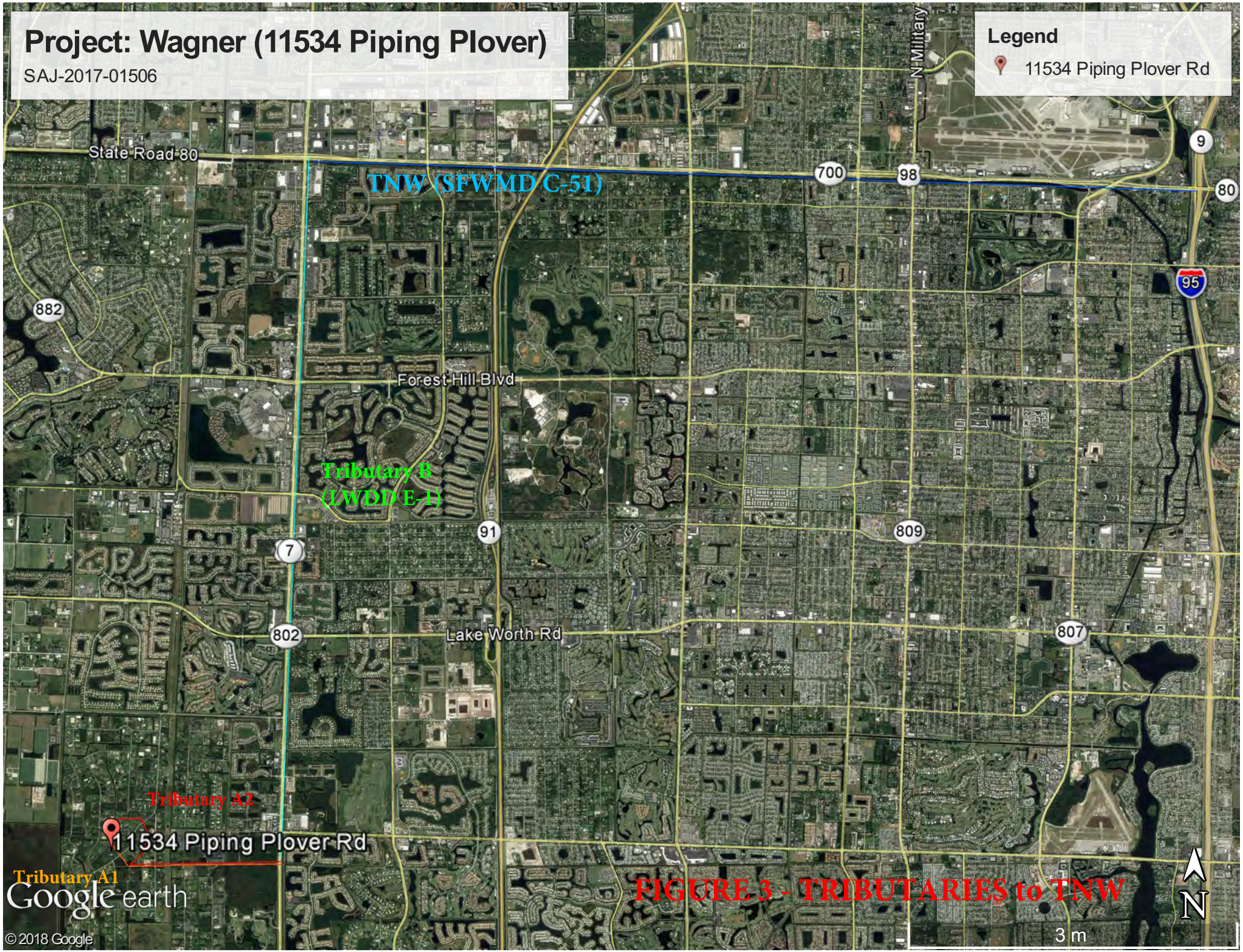

FIGURE 3 - TRIBUTARIES to TNW

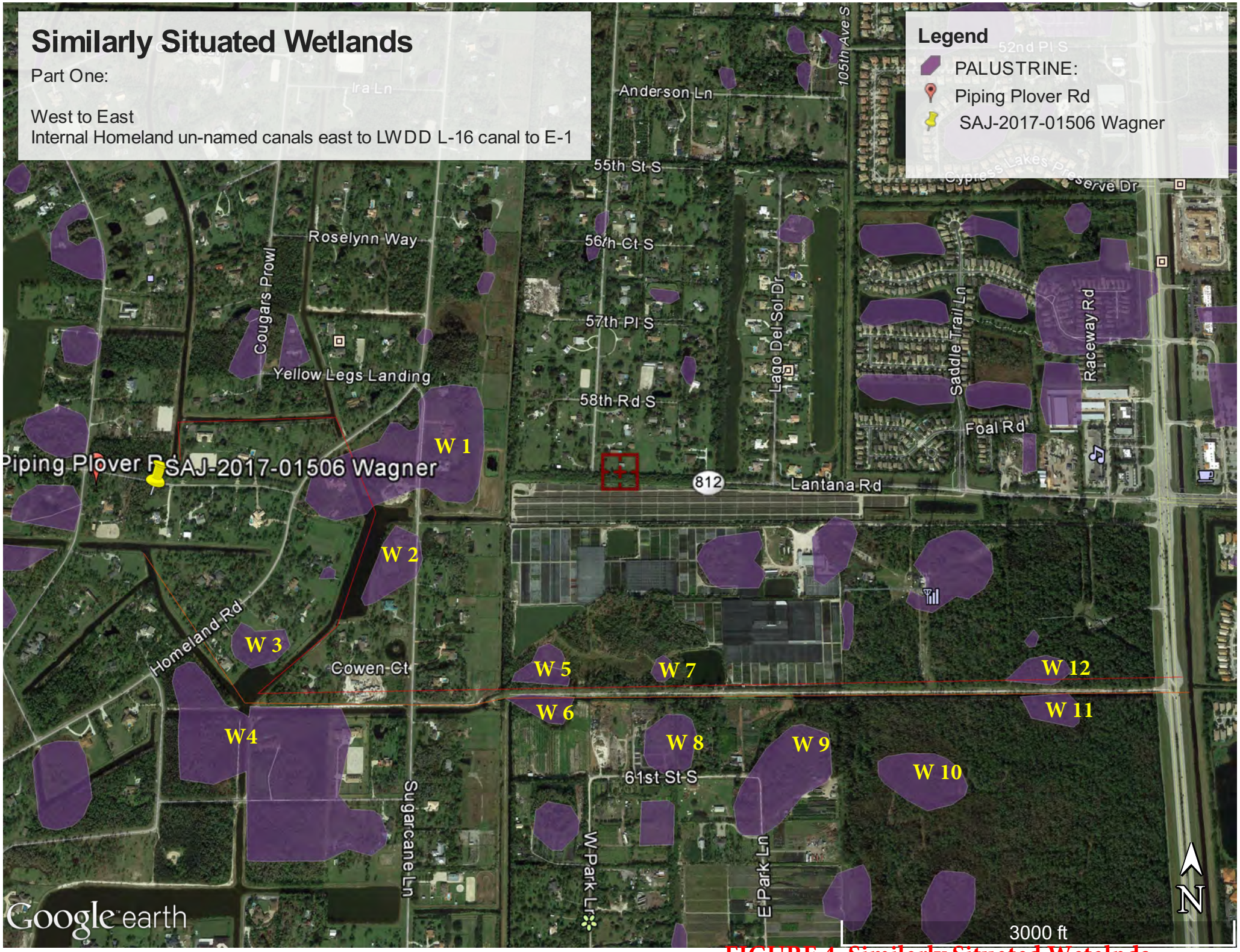

FIGURE 4: Similarly Situated Wetalnds

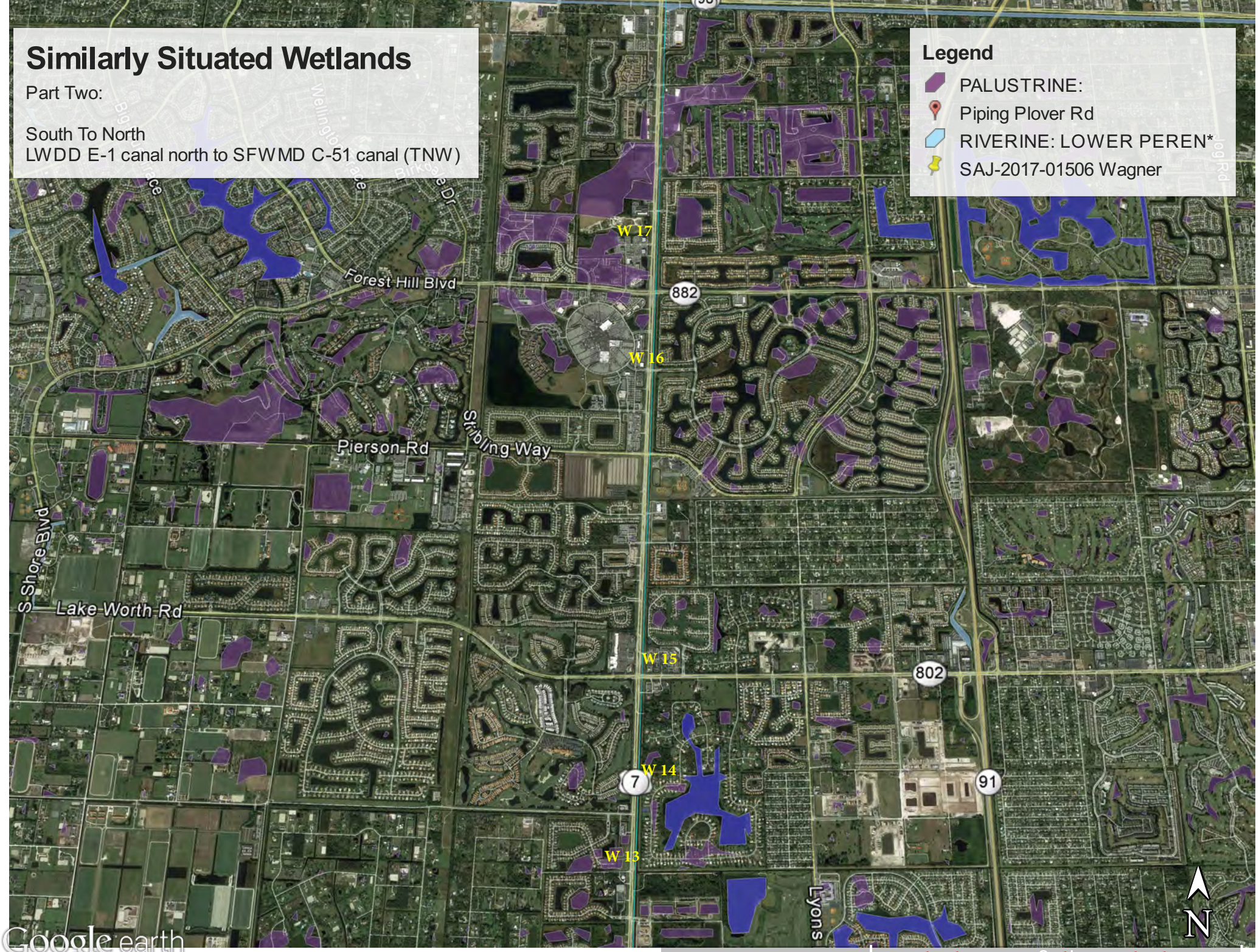

FIGURE 4: Similarly Situated Wetalnds

http://lwdd.maps.arcgis.com/home/webmap/viewer.html?webma

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Home 1-The Whole Kit and Caboodle Web Map

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SAJ-2017-01506

Legend

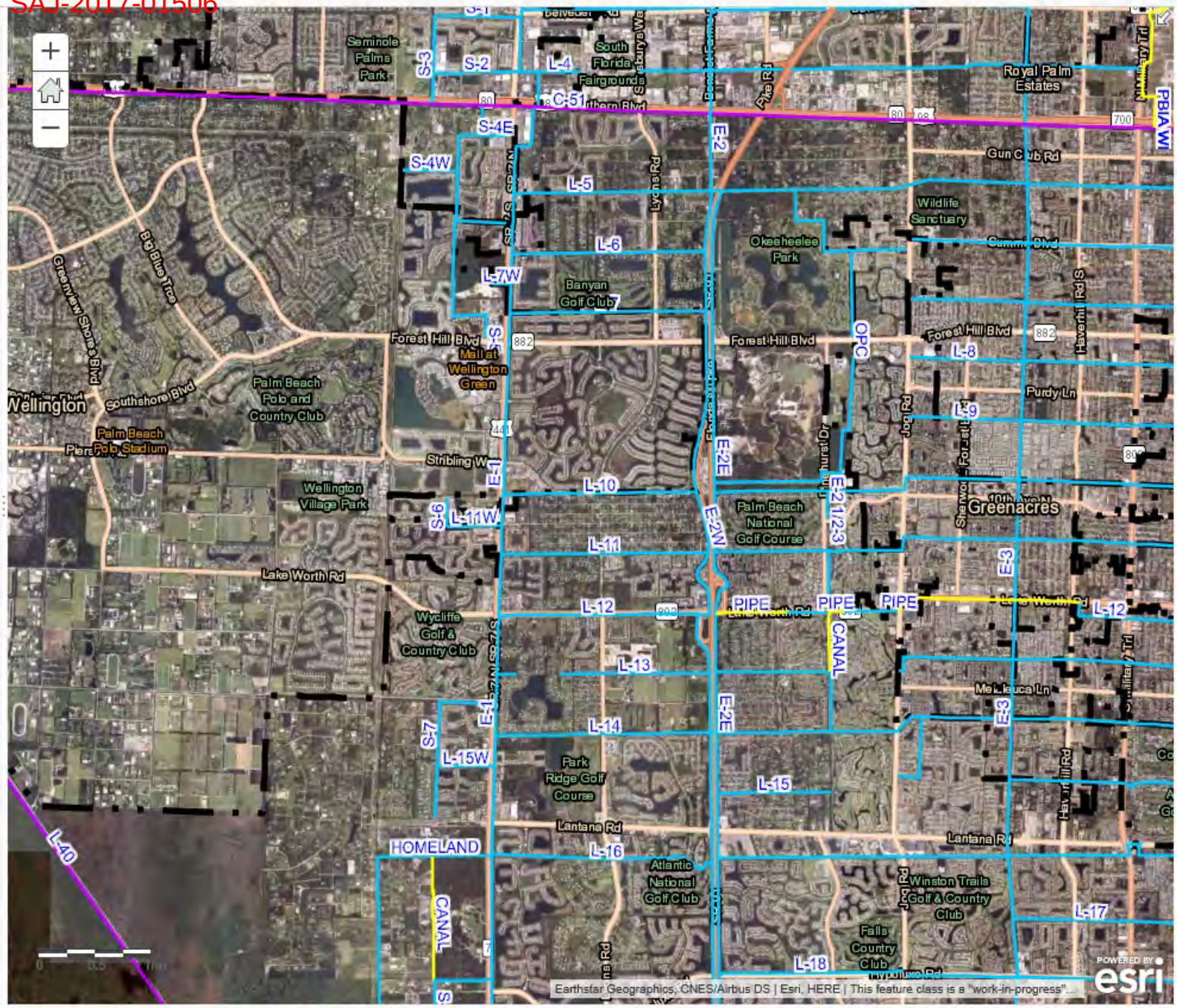
Canal Centerlines

- LWDD
- SFWMD
- OTHER

Municipal Areas

World Transportation

World Transportation



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Southeast Coast – Palm Beach, Broward and Miami-Dade Counties

Major Regional Canals

Features of the primary canals in eastern Miami-Dade, Broward, and Palm Beach counties are shown in **Figure C-6** and summarized in **Table C-17.** The major canals in these three counties are the coastal extensions of the West Palm Beach Canal, Hillsboro Canal, North New River Canal, and Miami Canal. Each of these canals originates in Lake Okeechobee, passes through the EAA and WCAs, and end at the coastline. These major canals provide regionwide management capabilities. They are used as outlets for regulatory releases from Lake Okeechobee and the WCAs, excess floodwaters from EAA lands, and runoff from the coastal basins. They also convey water supply releases from Lake Okeechobee or the WCAs to recharge local wellfields and protect the surficial aquifer against saltwater intrusion.

West Palm Beach Canal (C-51)

The C-51 basin has an area of approximately 164.3 square miles and is located in eastern Palm Beach County (**Figure C-6**). C-51 is the part of the West Palm Beach Canal east of L-40. The canal runs parallel to, and south of, State Road 80, from L-40 to Congress Avenue. East of Congress Avenue the canal extends to the south and then to the east, connecting to the lntracoastal Waterway at S-155 east of Lake Clarke. Water control structures in Palm Beach County are described in **Table C-18.**

The C-51 basin consists of two sub-basins, C-51 West (79.5 square miles) and C-51 East (84.8 square miles). Inflows to C-51 are by various canals that are part of an extensive local secondary and tertiary drainage system managed by the Lake Worth Drainage District (LWDD). Excess water in the east basin is discharged to tidewater at S-155. Excess water in the west basin is discharged to tidewater by way of G-124 and S-155 or to STA-1E. Water surface elevations in the eastern reach of C-51 are controlled by S-155 and in the western reach by G-124 and S-5A. Water supply to the basin can be made from WCA-1 by way of S-5AS and S-5AE; from Lake Okeechobee by way of the L-10/L-12 borrow canal, S-5AW, and S-5AE; from Lake Okeechobee by way of Culvert #10A, the L-8 borrow canal, and S-5AE; or from STA-1E.

Figure 6: SFWMD
C-51 East Basin

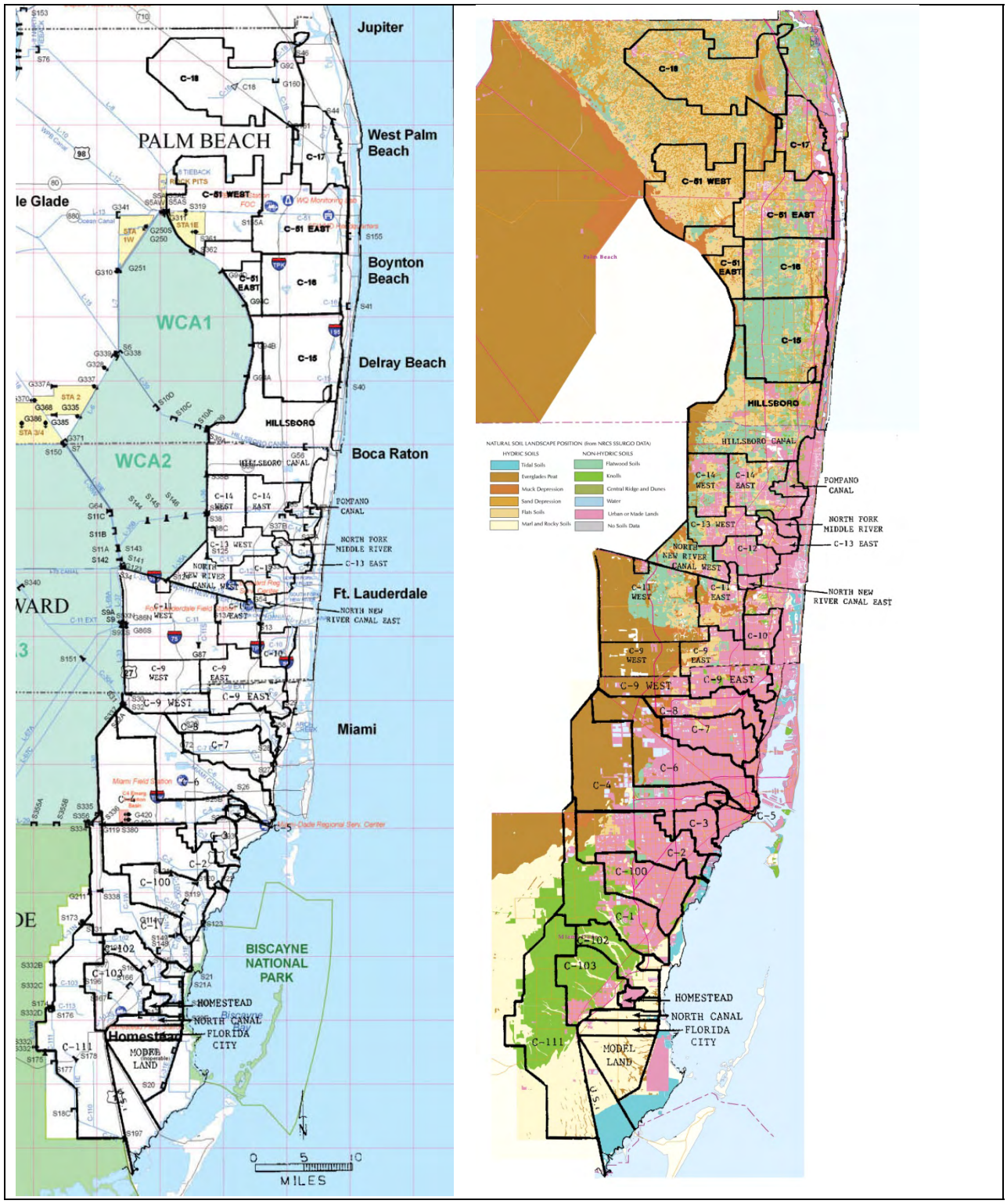
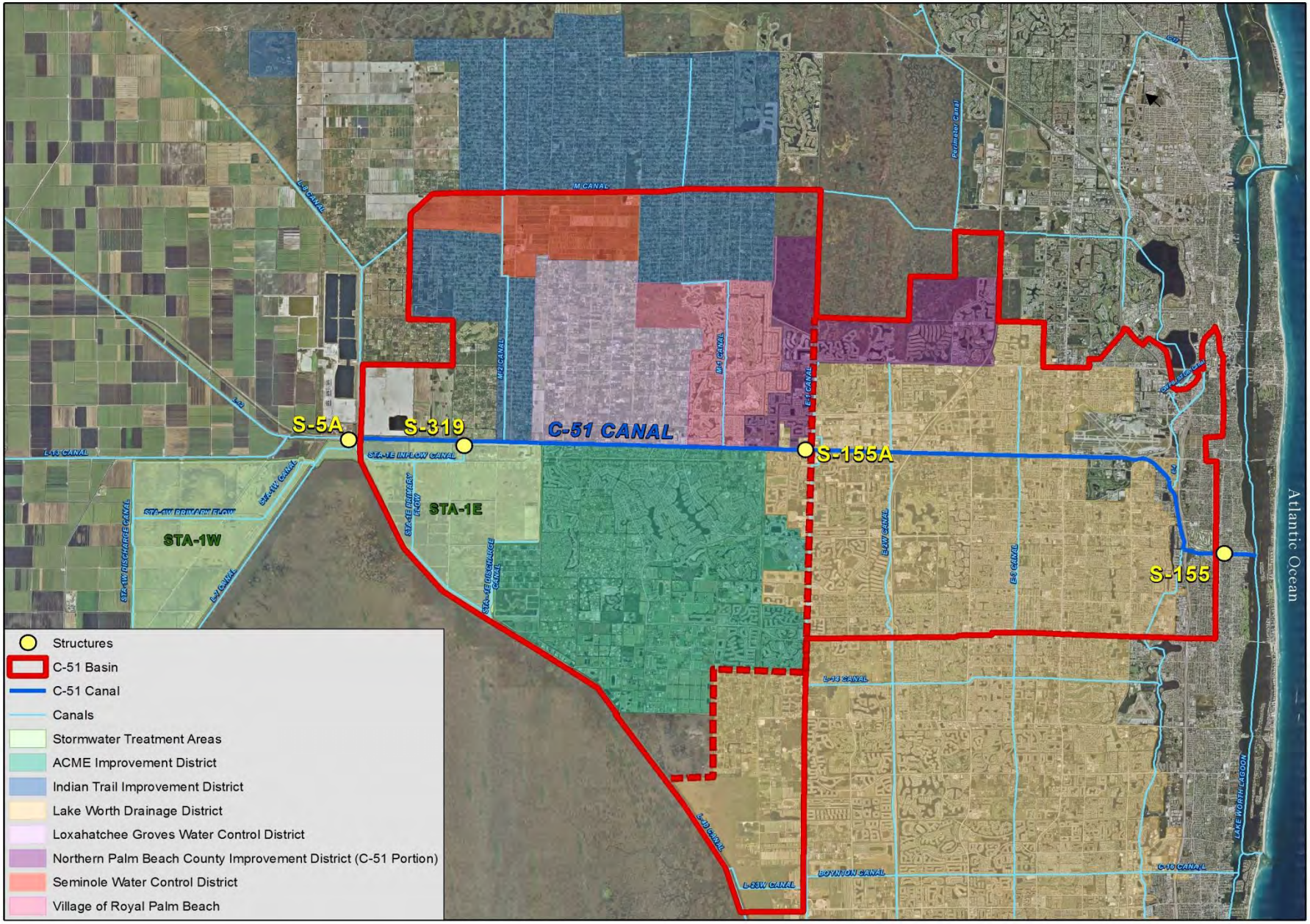


Figure C-6. A) SFWMD canals and structures, and B) natural landscape soil positions in coastal sub-basins of Miami-Dade, Broward, and Palm Beach counties (based on Zahina et al. 2001).

C-51 Basin with Local Drainage Districts (298 Districts)



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sfwmd.gov

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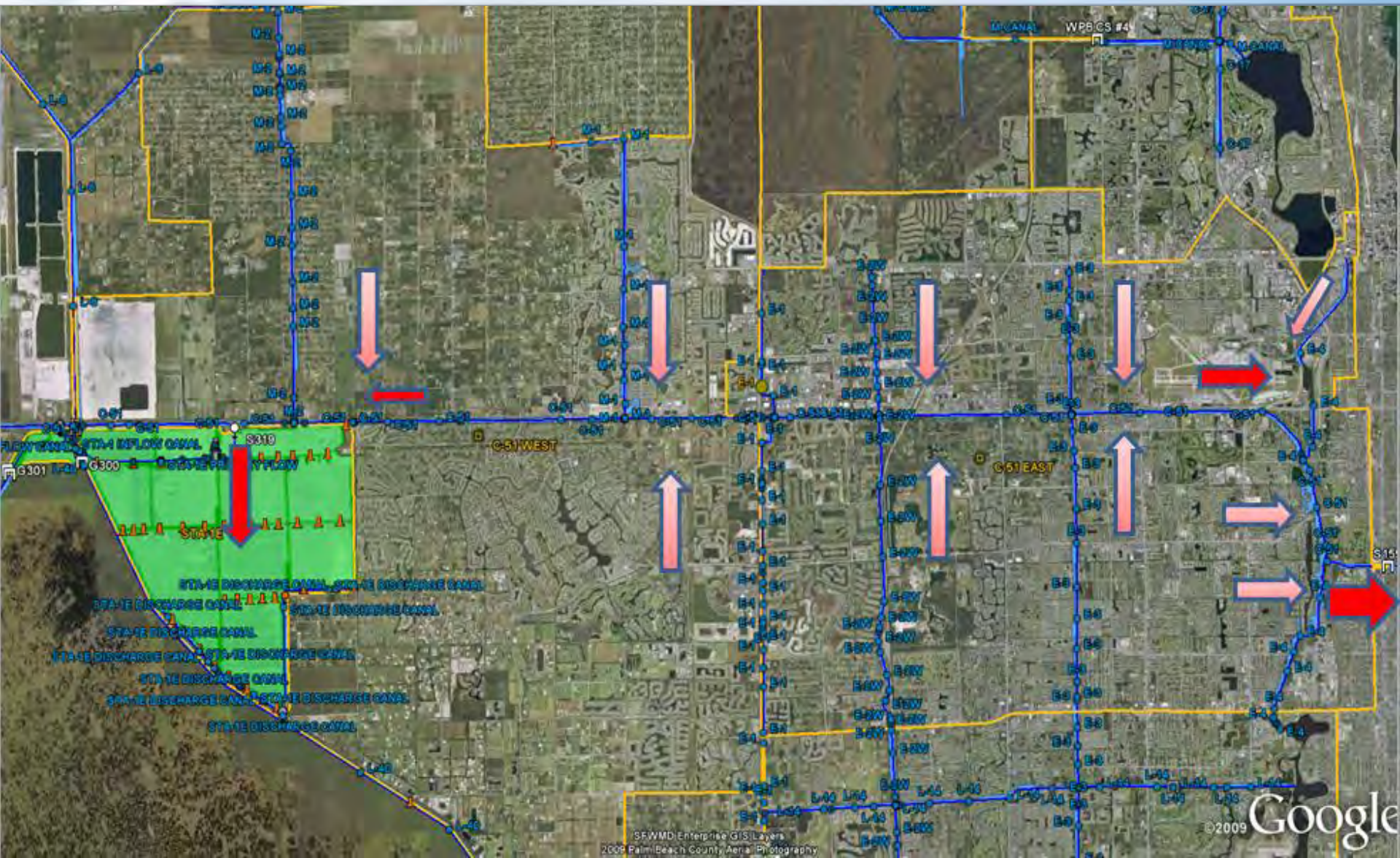
Conveyance for Flood Control - Current