KEY WORDS – INUNDATION, SATURATION

373.019(17) F.S. WETLANDS DEFINED – “…those areas that are inundated or saturated by surface water or ground water at a frequency and a duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils…” (Emphasis added)

CORPS OF ENGINEERS 1987 WETLAND MANUAL – “Those areas that are inundated or saturated by surface or ground water at a frequency and a duration sufficient to support and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions…” (Emphasis added)
SATURATED/INUNDATED

SOME WETLANDS MAY APPEAR DRY
WETLANDS – HOW WET?

- **Terrestrial System**
  - Hydrology: Dry
  - Biogeochemical Role: Source
  - Productivity: Low to Medium

- **Wetland**
  - Import of nutrients
  - Fluctuating water level
  - Intermittently to Permanently Flooded
  - Source, Sink or Transformer
  - Generally High but Sometimes Low

- **Deepwater Aquatic System**
  - Import/export of nutrients and biological species
  - Permanently Flooded
  - Sink
  - Generally Low
### 3 Categories of Field Indicators:

<table>
<thead>
<tr>
<th>Category</th>
<th>Examples</th>
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<tr>
<td>1) Plants</td>
<td>Vegetative index, stratum selection, dominance formulas</td>
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<tr>
<td>2) Soils</td>
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<tr>
<td>3) Hydrologic Indicators</td>
<td>Plant adaptations, aquatic fauna, evidence of flooding, etc.</td>
</tr>
</tbody>
</table>

**All Indicators are used with:**

- Reasonable Scientific Judgment
- The ability to collect and analyze information using technical skills and personal ecological experience as a basis for decision making
Unified Wetland Delineation Methodology (Rule 62-340, F.A.C.)

Goal of 62-340 was to combine all the different methodologies for wetland delineation into one universally excepted methodology.

All state and local regulatory agencies which use the word “wetland” must use 62-340, F.A.C. to define and delineate wetlands in all of Florida INCLUDING the Northwest district.
VEGETATION

VEGETATIVE INDEX – FOUR CATEGORIES

- OBLIGATES (OBL) – NEARLY ALWAYS IN WETLANDS
- FACULATIVE-WET (FACW) – MOST FREQUENTLY IN WETLANDS
- FACULTATIVE (FAC) – IN EITHER WETLANDS OR UPLANDS
- UPLAND (UPL) – NEARLY ALWAYS IN UPLANDS

Vegetative Index: does not include aquatic plants, vines, or any plants introduced after 1994. For all practical purposes these plants are “invisible”.

M. J. Nichols & Associates, LLC
14657 93rd Street North
West Palm Beach, Florida
www.mjnichols.com
VEGETATION

Wetland plants are those species that normally grow within areas of standing water or where the soils are saturated within the root zone long enough for anaerobic soil conditions to develop. Wetland plants have morphological and physiological characteristics that enable them to grow in these areas.
Florida Wetland Plants, An Identification Manual is available from IFAS by calling 1-800-226-1764 or through Amazon.com, keywords; author: Tobe, subject: Wetlands
VEGETATION INDEX – 62-340 (450)
FAC

62-340.450 Vegetative Index.

(1) Obligate Species

Acer maple, silver
saccharinum

Acoelorraphe palm, paurotis
wrightii

Acrostichum leather fern
spp.

Aeschynomene joint-vetch,
pratensis meadow

Agalinis linifolia false-foxglove,
flax-leaf

Agalinis false-foxglove,
maritima saltmarsh

Alisma water-plantain,
subcordatum subcordate

Alnus semulata alder, hazel

Alternanthera alligator-weed

philoxeroides

Alternanthera alligator weed,
(sessilis sessile

Amaranthus amaranth,
australis southern

Amaranthus amaranth,
cannabinus tidemarsh

Amaranthus amaranth,
floridanus Florida

Ammannia spp. toothcup

Annona glabra pond apple

Aristida affinis three-awn

grass, long-leaf

Armoracia lakecress
Florida wetlands generally include swamps, marshes, bayheads, bogs, cypress domes and strands, sloughs, wet prairies, riverine swamps and marshes, hydric seepage slopes, tidal marshes, mangrove swamps and other similar areas.
HYDRIC SOILS
National Resources Conservation Service (NRCS) guidelines for hydric soil field indicators

Hydric Soils and Hydric Soil Indicators: A hydric soil is a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile that favor the growth and regeneration of hydrophytic vegetation (USDA-NRCS 1991).
HYDRIC SOILS

National Resources Conservation Service (NRCS) guidelines for hydric soil field indicators

The State methodology strictly adheres to the National Resources Conservation Service (NRCS) guidelines for hydric soil field indicators

Source:
Field Indicators of Hydric Soils in the United States
The soil on the right is hydric. It meets the requirements of indicator S7 (Dark Surface). From the surface and to a depth of 10 cm, value is 3 or less and chroma is 1 or less. Below 10 cm, the matrix has chroma of 2 or less. The soil on the left is not hydric. It does not have a dark surface horizon thick enough to meet the requirements of indicator S7 and does not meet the requirements of any other indicator.

Field Indicators of Hydric Soils in the United States
errata March 2013

Source:
Field Indicators of Hydric Soils in the United States
HYDRIC SOILS

National Resources Conservation Service (NRCS) guidelines for hydric soil field indicators

Indicator A1 (Histosol or Histel). This soil has more than 30 inches of organic material, starting at the surface.

Source:
Indicator A5 (Stratified Layers) in sandy material. The soil also meets the requirements of indicator A6 (Organic Bodies).

HYDRIC SOILS

National Resources Conservation Service (NRCS) guidelines for hydric soil field indicators

A7. 5 cm Mucky Mineral. For use in LRRs P (except for MLRA 136), T, U, and Z. A layer of mucky modified mineral soil material 5 cm (2 inches) or more thick, starting within 15 cm (6 inches) of the soil surface.

Source:
Field Indicators of Hydric Soils in the United States
Indicator S6 (Stripped Matrix). This indicator requires diffuse splotchy patterns with rounded areas stripped of organic matter or iron, as exemplified in this photo.

Source:
HYDROLOGIC EVIDENCE

SUFFICIENT HYDROLOGY, UNDER NORMAL CONDITIONS, AFFECTS ASPECTS OF VEGETATION, SOILS AND GEOMORPHOLOGY

62-340.300 LANDWARD EXTENT (BOUNDARY)

DETERMINED BY APPLYING REASONABLE SCIENTIFIC JUDGEMENT TO EVALUATE:

1. PLANT SPECIES
2. SOILS
3. OTHER HYDROLOGIC EVIDENCE OF REGULAR & PERIODIC INUNDATION AND SATURATION
HYDROLOGIC INDICATORS
CHAPTER 62-340.300 FAC

- HYDROLOGIC INDICATORS REQUIRED FOR WETLAND DETERMINATIONS (“A” “B” & “D”)
- STAND ALONE SOILS TEST – VERY WET SOILS – ASSUMES SUFFICIENT HYDROLOGY
PRACTICAL CONSIDERATIONS
“GET THE BIG PICTURE FIRST”
PRACTICAL CONSIDERATIONS
“GET THE BIG PICTURE FIRST”

WETLAND DELINEATIONS – A SNAPSHOT, NOT A VIDEO OR MOVIE

- PUT THE SITE INTO ITS LARGER HYDROLOGIC CONTEXT
- GET AS MUCH DATA ABOUT THE SITE AS PRACTICAL – METEROLOGIC, HYDROLOGIC, TOPOGRAPHIC, SOIL SURVEY
- GET A FEEL FOR THE HYDROLOGIC REGIME, HYDROPATTERN, HYDROPERIOD
WETLANDS – HOW WET?

A CONTINUUM

ARID

MESIC

DRY

WET
DYNAMIC – NOT STATIC

- CLIMATE CHANGE
- NORMAL CYCLICAL CLIMATE/WEATHER PATTERNS
- ANTHROPOGENIC INFLUENCES – GROUND & SURFACE WATER MANIPULATION (i.e. DRAINAGE CANALS, STRUCTURES, IRRIGATION & WATER SUPPLY Wells)
HYDROLOGIC INDICATORS
CH. 62-340.500 FAC

- ALGAL MATS
- AQUATIC MOSSES OR LIVERWORTS ON TREES OR SUBSTITUTES
- AQUATIC PLANTS
- AUFWUCHS
- DRIFT LINES AND RAFTED DEBRIS
- ELEVATED LICHEN LINES
- EVIDENCE OF AQUATIC FAUNA
- HYDROLOGIC DATA
- MORPHOLOGICAL PLANT ADAPTATIONS
- SECONDARY FLOW CHANNELS
- SEDIMENT DEPOSITION
- VEGETATED TUSSUCKS OR HUMMOCKS
- WATER MARKS
HYDROLOGIC INDICATORS
CORPS ’87 MANUAL
REGIONAL SUPPLEMENT
PRIMARY INDICATORS

- VISUAL OBSERVATION OF INUNDATION
- VISUAL OBSERVATION OF SOIL SATURATION
- WATER MARKS
- DRIFT DEPOSITS
- SEDIMENT DEPOSITS
- ALGAL MAT OR CRUST
- DRAINAGE PATTERNS (STREAMBEDS)
- IRON DEPOSITS
- INUNDATION VISIBLE ON AERIAL IMAGERY
- WATER STAINED LEAVES
- AQUATIC FAUNA
- MARL DEPOSITS
HYDROLOGIC INDICATORS

ALGAL MATS
HYDROLOGIC INDICATORS

ALGAL MATS

Consider other factors before applying this one.

USE CARE!
HYDROLOGIC INDICATORS

- Elevated lichen lines
- Buttressed trunks
HYDROLOGIC INDICATORS

- EVIDENCE OF AQUATIC FAUNA

USE CARE!
HYDROLOGIC INDICATORS

HIGH WATER MARKS
“The Term ‘Wetland Hydrology’ encompasses all hydrologic characteristics that are periodically inundated or have soils saturated to the surface at some time during the growing season...”
“…Hydrology is often the least exact of the parameters, and indicators of wetland hydrology are sometimes difficult to find in the field. However, it is essential to establish that a wetland area is periodically inundated or has saturated soils during the growing season.” (Emphasis added).
WETLAND HYDROLOGY
CHAPTER 62-340.550 FAC
REFUTING HYDROLOGY

- CAN BE REFUTED BY RELIABLE HYDROLOGIC RECORDS OR SITE SPECIFIC HYDROLOGIC DATA
- NO INUNDATION FOR SEVEN CONSECUTIVE DAYS OR SATURATION FOR TWENTY CONSECUTIVE DAYS
- DATA REPRESENTATIVE OF LONG-TERM HYDROLOGIC CONDITIONS
October 23, 1998

Mr. Michael J. Nichols  
Cinven Thompson & Associates  
1563 NW 23rd Street  
Ft. Lauderdale, FL 33309

Re: Brewer Lot 93-C, Pine Tree Estates  
BCDNRP File No. 028049

Dear Mr. Nichols:

This letter is in response to your letter of September 18, 1998. We are in agreement that at this time, the referenced site does not meet the hydrologic criteria within 62-340.530 F.A.C. based upon information you submitted for the period of 8/10/98 through 9/15/98, and therefore this site is not, at this time, subject to regulatory authority under Section 27-331-341 of the Broward County Code of Ordinances for placement of fill. The application will be considered withdrawn and the file closed.

If you have any questions, you may contact Mark Wallace or me at the above address.

Sincerely,

Kathryn Carter  
Wetlands Resources Manager

Paul Brewer
NAILING DOWN HYDROLOGY
SOME PRACTICAL EXAMPLES

“...Hydrology is often the least exact of the parameters, and indicators of wetland hydrology are sometimes difficult to find in the field...”

PAGE 29 OF CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL

TECHNICAL REPORT Y-87-1 ('87 MANUAL)

...BUT IT MAY DEPEND UPON WHO’S LOOKING!

- Regional – USGS and SFWMD Well Data
- Water Control Structure Data - Long
- In-Situ Well Data
- Coordinate Data to Long Term Monthly Rainfall Data
- Controlled Primary, Secondary, Tertiary Canal Network
- Backstop – refuting hydrology through modeling