FILE

INTERNAL TRACKING SHEET FOR JURISDICTIONAL DETERMINATIONS

(to be used for accounts where no letter is being sent)

Account #: MVN 2007-02926-SZ   Account Name: Lafourche Parish Government

DETERMINATION DATE: 15 Oct. 2007   SUBJECT: Jurisdictional Determination

MEMORANDUM FOR CEMVN-OD-SC, ATTN: John Herman

MEMORANDUM FROM CEMVN-OD-SS, Surveillance & Enforcement Section

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PARISH: Lafourche   SECTIONS 11 - 15   TWP 16S   RANGE 19E

PROPERTY/PROJECT DESCRIPTION: proposed ROW for Mathews Canal cleaning along the south spoil bank of the canal and a tributary. total length is approximately 18,500 linear ft and 80-100' width. Approximately 2.3 ac. of mechanized land clearing and 0.2 ac. of redeposition into tidal wetlands.

OWNER/COMPANY NAME: Lafourche Parish applied with CZM (P20071009), J. Wayne Plaisance, Inc. listed as agent.

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1. After careful review, the Surveillance & Enforcement Section has determined that this property/project is:

NONWETLAND ☐

MIXED ☒

WETLAND ☐

NO PERMIT REQUIRED ☐

AND/OR SECTION 10 ☒

OTHER: Water of U.S. ☐

☒ A map is enclosed that outlines the wetland or nonwetland area that has been delineated.

2. Additional comments: Unauthorized activities on property. Violation tracking No. T2007-1033.

3. P.O.C. for this determination: Furcy Zeringue,   x 2099

PENGAD-Bayonne, N.J.
GOVERNMENT
EXHIBIT
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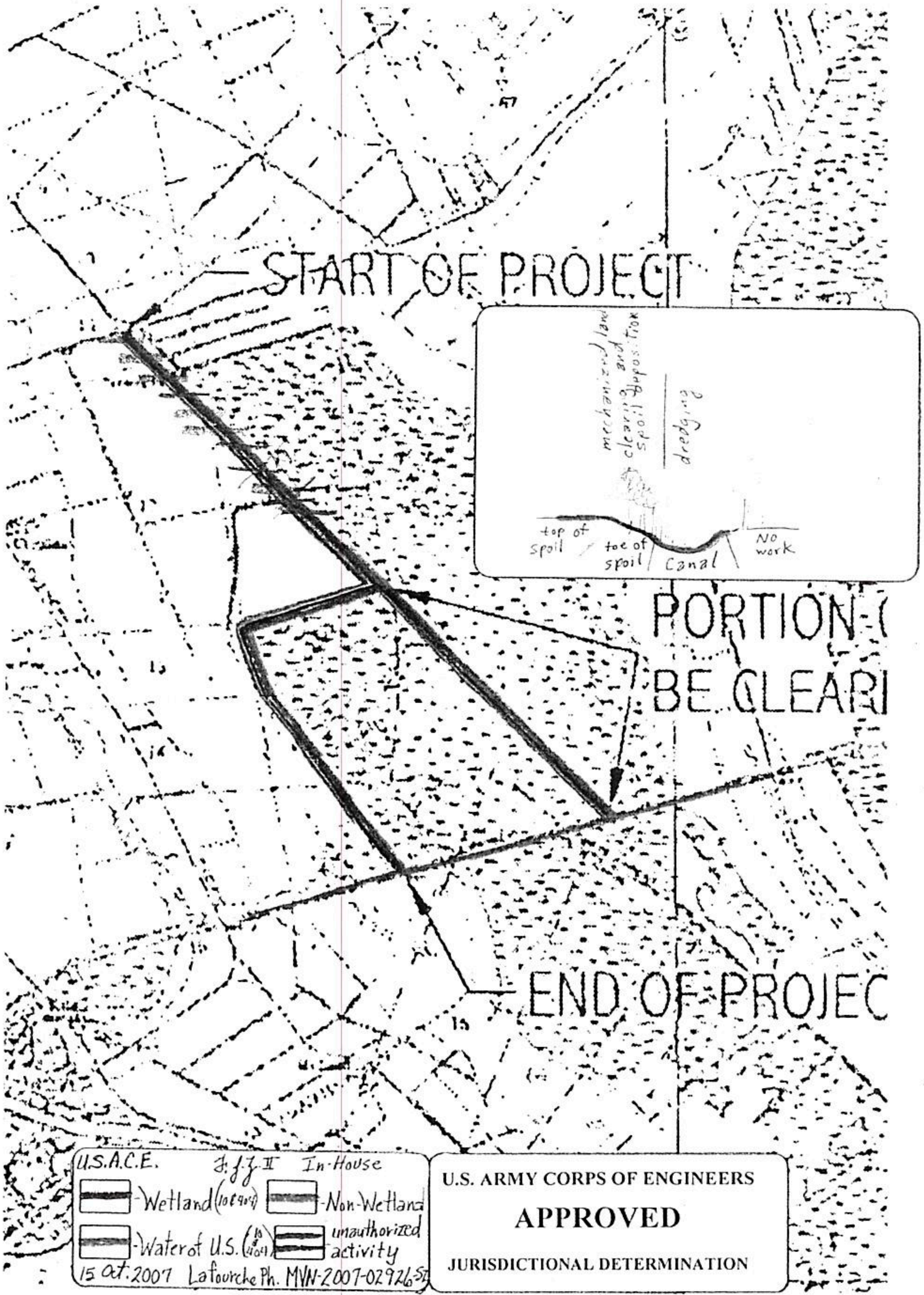

U.S. ARMY CORPS OF ENGINEERS

APPROVED

JURISDICTIONAL DETERMINATION

Edited APPROVED JURISDICTIONAL DETERMINATION FORM

U.S. Army Corps of Engineers

To view the unedited version of the form go to: http://www.mvn.usace.army.mil/regulatory/finalform.htm.

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): 15 Oct 2007

B. DISTRICT OFFICE, FILE NAME, AND NUMBER:MVN 2007-02926-SZ

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State:Louisiana County/parish/borough: Lafourche City: Mathews

Center coordinates of site (lat/long in degree decimal format): Lat. 29.669451° N, Long. 90.515084° W.

Universal Transverse Mercator:

Name of nearest waterbody: Mathews Canal

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Mathews Canal

Name of watershed or Hydrologic Unit Code (HUC): 08090301-East Central Louisiana Coastal.Louisiana

☒ 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: 15 Oct 2007

☒ Field Determination. Date(s): 11 Oct 2007

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are** "*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):

☒ TNWs, including territorial seas
☒ Wetlands adjacent to TNWs
☐ Relatively permanent waters (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: 18000 linear feet: 40 width (ft) and/or acres.

Wetlands: 10.3 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):

☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: .

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: **Mathews Canal**.

Summarize rationale supporting determination: Mathews Canal is subject to the ebb and flow of the tides. .Mathews Canal intersects Company Canal. Company Canal connects Bayou Des Allemands (3/4 mile north of its confluence with Lake Salvadore) and Bayou Lafourche and Intracoastal Waterwy. All 3 connecting waters are tidal at the point of intersection with Company Canal. Both Lake Salvadore and Bayou Lafourche have direct connections with the Gulf of Mexico.

2. **Wetland adjacent to TNW**
Summarize rationale supporting conclusion that wetland is "adjacent": Lower portion of the side slope of the spoli is saturated above the water level of the canal.These wwetlands are contiguous with the wetlands that are tidal.

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

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

(i) General Area Conditions:
Watershed size: **Pick List**
Drainage area: **Pick List**
Average annual rainfall: inches
Average annual snowfall: inches

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

Project waters are **Pick List** river miles from TNW.
Project waters are **Pick List** river miles from RPW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Project waters are **Pick List** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: .

Identify flow route to TNW:
Tributary stream order, if known: .

(b) General Tributary Characteristics (check all that apply):
Tributary is: ☐ Natural
☐ Artificial (man-made). Explain: .
☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):
Average width: feet
Average depth: feet
Average side slopes: **Pick List.**

Primary tributary substrate composition (check all that apply):
☐ Silts
☐ Cobbles
☐ Bedrock
☐ Other. Explain: .
☐ Sands
☐ Gravel
☐ Vegetation. Type/% cover:
☐ Concrete
☐ Muck

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: .
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: **Pick List**
Tributary gradient (approximate average slope): %

(c) Flow:

Tributary provides for: **Pick List**

Estimate average number of flow events in review area/year: **Pick List**

Describe flow regime: .

Other information on duration and volume: .

Surface flow is: **Pick List.** Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .

☐ Dye (or other) test performed: .

Tributary has (check all that apply):

☐ Bed and banks

☐ OHWM (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. 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: .

Identify specific pollutants, if known:

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

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

☐ Wetland fringe. Characteristics: .

☐ Habitat for:

- ☐ Federally Listed species. Explain findings: .
- ☐ Fish/spawn areas. Explain findings: .
- ☐ Other environmentally-sensitive species. Explain findings: .
- ☐ Aquatic/wildlife diversity. Explain findings: .

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: acres

Wetland type. Explain: .

Wetland quality. Explain: .

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

(b) General Flow Relationship with Non-TNW:

Flow is: **Pick List**. Explain:

Surface flow is: **Pick List**

Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .

☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:
- ☐ Directly abutting
- ☐ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain: .
  - ☐ Ecological connection. Explain: .
  - ☐ Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are **Pick List** river miles from TNW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Flow is from: **Pick List.**
Estimate approximate location of wetland as within the **Pick List** 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: .
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: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

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

All wetland(s) being considered in the cumulative analysis: **Pick List**
Approximately ( ) 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)

Summarize overall biological, chemical and physical functions being performed: .

C. SIGNIFICANT NEXUS DETERMINATION

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** .

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: 18000 linear feet40 width (ft), Or, acres.
   - ☒ Wetlands adjacent to TNWs: 10.3 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 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: 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.**
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):

☐ 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: .

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:Permit Application submitted by agent.
☐ 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:Lockport 7.5 min. topo, Houma and Cut Off LA 15 min topos.
☒ USDA Natural Resources Conservation Service Soil Survey. Citation:Lafourche Parish Soil Survey.
☐ 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):Lockport SE - 1998, 2004 IRs.
  or ☒ Other (Name & Date):On-site photos taken by John Herman.
☐ Previous determination(s). File no. and date of response letter: .
☐ Applicable/supporting case law: .
☐ Applicable/supporting scientific literature: .
☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: .

VIOLATION REPORT FORM

ORM #: MVN-2007-02926-SE

DATE REPORTED: 11 Oct. 2007

TRACKING #: T 2007-1033

DATE ASSIGNED: 15 Oct 2007

INVESTIGATOR: Zeringue

V-NAME: Lafourche Par. Gov.

d/b/a:

V-ADDRESS: P.O. Drawer 5528
Thibodaux, LA 70302

AGENT: J. Wayne Plaisance, Inc.

CONSULTANT: Andre Uzee

PERSON MAKING VIOLATION ALLEGATION:
Corps - John Herman
discovered during Permit App. Site Insp.

Existing JD #:

TELEPHONE NUMBERS & TYPE

( ) -

( ) -

(985) 632 - 5628

(985) 632 - 5596 ph

REPORT TAKEN BY:

TELEPHONE NUMBER & TYPE

(504) 862 - 1581

DESCRIPTION OF VIOLATION: Mechanized land clearing, dredging, and deposition of material in wetlands.

LOCATION INFORMATION

PARISH: Lafourche

SITE SIZE: ~2.5 ac - already impacted. WW: Mathews Canal

Other site info - Permit app. for work submitted thru CZ - P 20071009 - 07/16/2007
UA Confined to Sec. 11, 12 ; HUC: 08090301 - East Central Louisiana Coastal. Louisiana

SECTION 11 - 15

TOWNSHIP 16 S.

RANGE 17 E.

Quad 27-B: Lockport

Lat: 29.669451

Lon: -90.515084

IR: Lockport SE

Soil Map 41

Soil Types FA BB, AN, sk

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AUTHORITY: 404 [✓ BOTH]

EARLY RESOLUTION: DATE RESOLVED: DATE CLOSED:

☐ Permit Exists - P#:

☐ Not a Regulated Activity - [NPR]

☐ No Violation Exists - [NPR]

DATE VIOLATION CONFIRMED: 11 Oct. 2007

OTHER RESOLUTION: DATE RESOLVED: DATE CLOSED:

☐ Admin. Close -

☐ Restoration -

☐ After-the-Fact - Application Recd Forwarded

INITIAL CONTACT DATE: 11 Oct. 2007 BY: John Herman (OD-SE)

NOTES: Conducted Field Site Inspection and discovered the work had already begun. Completely walked the area - down entire length (with ATV) photographed along the way - I issued verbal C&D to agent and crew foreman. estimated ~1400' of mechanized clearing in wetlands spilling material and ~ 600' of excavation w/ spoil deposition - primarily in keyed existing spoil banks - JJH

15 Oct. 2007 - I called Andre [illegible] & [illegible] to re-iterate C&D - both assured me [illegible] work should [illegible]. JJH

Revised 4 May 2006

Memo For Information

SUBJECT: Violation No. MVN-2007-02926-SZ-Mathews Canal Cleanout; Mrs. Charlotte Randolph, Lafourche Parish President

- 11 Oct. 2007 – Mr. John Herman, while conducting a site inspection for the processing of a standard permit application, discovered work associated with the proposed cleanout of Mathews Canal had already begun. The site is located in Sections 11,12,13,14, and 15, Township 16 South, Range 19 East, near Mathews, Louisiana.

- The violation is the unauthorized dredging in a Navigable (tidal) water-Mathews Canal, and the unauthorized deposition of fill into jurisdictional waters and wetland (Mathews Canal and its abutting wetlands) in violation of Sec. 301 of CWA and Sec 10 of RHA of 1899. Approximately 2.3 ac (4000' X 25') of wetlands cleared, and 0.21-ac (600' X 15') filled, and 600' of Mathews Canal dredged.

- 15 Oct. 2007 – Verbal C&D issued to Mr. Andre Uzee, agent for Lafourche Parish Council and Mr. Ray Cheramie, Lafourche Parish Council, based on conversations with and memo of violation description and photos received from John Herman. I was assured the work has stopped in Mathews Canal. I also made them aware that since there are two cases for the parish at EPA, they would also request this one. Permit processing suspended until resolution of legal issues.

- 6 Nov. 2007 – Communicated with John Herman and Andre Uzee that work in the drainage in the cane field did not require a permit and could continue.

- Jan 2008 – EPA requested this case based on the two pending actions. I forwarded the application and John's memo and photos to Donna. She said they are considering combining this with Rouse/Theriot Canal Violation in a combined Complaint.

- 15 Apr. 2008 – Called Agent, Andre Uzee, to verify compliance with C&D. He said no further work done on Mathews Canal. He also informed me that Mr. Cheramie's appointment as Director of Public Works was not approved by the Council.

PENGAD-Bayonne, N. J.
GOVERNMENT EXHIBIT
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VIOLATION REPORT FORM

DATE REPORTED: 11 Oct. 2007

ORM #: MVN-2007-02926-SZ

TRACKING #: T 2007-1033

DATE ASSIGNED: 15 Oct 2007

INVESTIGATOR: Levingue

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V-NAME: Lafourche Par. Gov.

Existing JD #:

d/b/a:

TELEPHONE NUMBERS & TYPE

V-ADDRESS: P.O. Drawer 5528
Thibodaux, LA 70302

AGENT: J. Wayne Plaisance, Inc. (985) 632-5628

CONSULTANT: Andre Uzee (985) 632-5596 ph

PERSON MAKING VIOLATION ALLEGATION:
Corps - John Herman
discovered during Permit App. Site Ins.

REPORT TAKEN BY:

TELEPHONE NUMBER & TYPE
(504) 862-1581

DESCRIPTION OF VIOLATION: Mechanized land clearing, dredging, and deposition of material in wetlands.

================================LOCATION INFORMATION================================

PARISH: Lafourche

SITE SIZE: ~2.5 ac - already impacted.

WW: Mathews Canal

Other site info - Permit app. for work submitted thru CZ - P 20071009 - 07/16/2007
UA Confined to Sec. 11, 12 ; HUC: 08090301 - East Central Louisiana Coastal. Louisiana

SECTION 11 - 15
TOWNSHIP 16 S.
RANGE 19 E.

Quad 27-B: Lockport
Lat: 29.669451
Lon: -90.515084
IR: Lock Port SE

Soil Map 41
Soil Types FA BB, AN, sk

10
AUTHORITY: 404
[✓ BOTH]

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EARLY RESOLUTION: DATE RESOLVED: DATE CLOSED:

☐ Permit Exists - P#:

☐ Not a Regulated Activity - [NPR]

☐ No Violation Exists - [NPR]

DATE VIOLATION CONFIRMED: 11 Oct. 2007

OTHER RESOLUTION: DATE RESOLVED: DATE CLOSED:

☐ Admin. Close -

☐ Restoration -

☐ After-the-Fact - Application Recd Forwarded

INITIAL CONTACT DATE: 11 Oct. 2007 BY: John Herman (OD-SC)

NOTES: Conducted Field Site Inspection and discovered the work had already begun. We photographed the area - drove entire length (with ATV) photographed along the way - I Issued verbal C&D to agent and crew forman? estimated ~4000' of mechanized clearing in wetlands abutting Mathews Canal. and ~600' of excavation w/ spoil deposition - primarily in keyed existing spoil bank - JJH

15 Oct. 2007 - I called Andre & Ray Cheramie to re-iterate C&D - Both assured me no more work would occur. JJH

Revised 4

GOVERNMENT EXHIBIT 40

PENGAD-Bayonne, N.J.

ENFORCEMENT CHECKLIST:

(1) Regulatory Authority: ☐ 10 ☐ 404 ☒ Both

(2) Is the property 100% wetland? ☐ YES ☒ NO ☐ Unknown

(3) What is the size of the wetland impact? ~ 2.5 ac.

(4) Are the wetlands tidally influenced? ☒ YES ☐ NO

(5) Are other waters impacted? ☒ YES ☐ NO

(6) If yes, these waters are... ☐ 404 Only ☒ Tidal ☐ Navigable

(7) Was hauled fill deposited on site? ☐ YES ☒ NO

(8) Mechanized landclearing? ☒ YES ☐ NO

(9) Ditching? ☐ YES ☒ NO

(10) Other unauthorized activity? dredging in Sec 10 water w/o permit

ADDITIONAL COMMENTS/NOTES:

6 Nov. 2007 – Andree called re: work in sugar cane field drains. - only herbaceous & small woody vegetation present. - regularly maintained - field drain. - no permit required - I re-iterated the verbal C&D issued by John H. Andre acknowledged that no further work would be done w/out a permit, and that none had occurred since John's site inspection. I also made Adree aware that the previous violations made it necessary to inquire if EPA was interested in taking lead in the case. JJZ

28 Jan. 2008 - Talked with Donna Mullins. EPA. - follow up on previous conversation. They will take lead wanted a few more details. JJZ - (Had previously sent application & photos from John Herman

Memo For Information

SUBJECT: Violation No. MVN-2006-1353-SZ-Proposed Rouse/Theriot Outfall Canal - Mrs. Charlotte Randolph, Lafourche Parish President

- 27 Feb. 2006 - A report of an unauthorized activity was received from an anonymous source. The site is in Section 19, Township 15 South, Range 17 East, southeast of Thibodaux, Lafourche Parish, Louisiana.

- The violation is the unauthorized deposition of fill material associated with mechanized landclearing and excavation of a new drainage canal through wetlands. This work is in violation of Section 301 of the Clean Water Act. Approximately 9 acres of wooded wetlands were cleared.

- 2 March 2006 - Mr. Ray Cheramie, Lafourche Parish Director of Public Works was issued verbal Cease and Desist (C&D). He advised that the parish had stopped work and would await our Field Inspection.

- 3 March 2006 - A field inspection was conducted by Mr. Furcy Zeringue of the Corps accompanied by Mr. David Poincon of the Parish Public Works Department. The entire 3880' X 100' corridor of the proposed canal has been mechanically cleared and debris mixed with soil deposited in adjacent forested areas. Approximately 600 feet of the canal has been excavated with the dredged material deposited in wetlands. Mr. Zeringue reiterated Verbal C&D and explained that the MOA with EPA had been triggered.

- 8 May 2006 – C&D issued to Parish to stop further unauthorized work and request comments as to why the work was started prior to obtaining authorization given their knowledge of the program and the cases currently at EPA.

- Fall 2006 – EPA requested the case since they are lead on levee case by the Parish and may figure in the penalty associated with that case as well. Info forwarded to EPA.

- 16 Jan 2007 Comment package received from the Parish. Did not address why the work begun without permit.

- 20 Aug 2007 EPA Complaint filed (Docket # CWA-06-2007-2725)

- 17 Aug 2007 Congressional (Vitter) status of ATF – Interim Response on 31 Aug. 2007 and final Response on 31 Aug. 2007.

- 4 Sep. 2007 phone call from Allan Richey of Sen. Landrieu's office to check status.

PENGAD-Bayonne, N. J.
GOVERNMENT
EXHIBIT
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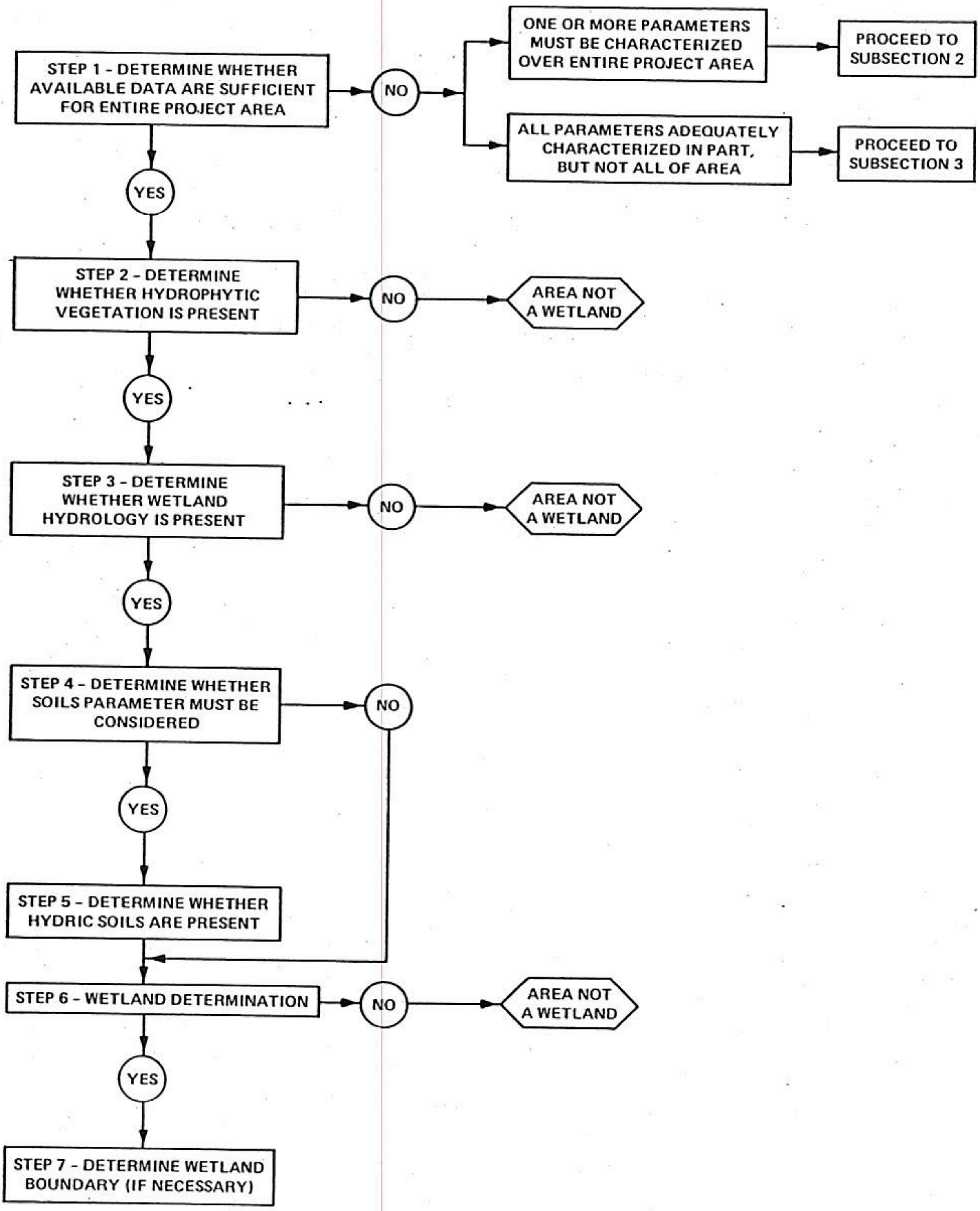

Figure 13. Flowchart of steps involved in making a wetland determination when an onsite inspection is unnecessary

the vegetation, soils, and hydrology are not adequately characterized for any portion of the area, PROCEED TO Subsection 2.

- <u>STEP 2 - Determine Whether Hydrophytic Vegetation Is Present.</u> Examine the vegetation data and list on DATA FORM 1 the dominant plant species found in each vegetation layer of each community type. *NOTE: A separate DATA FORM 1 will be required for each community type.* Record the indicator status for each dominant species (Appendix C, Section 1 or 2). When more than 50 percent of the dominant species in a plant community have an indicator status of OBL, FACW, and/or FAC,* hydrophytic vegetation is present. If one or more plant communities comprise of hydrophytic vegetation, PROCEED TO STEP 3. If none of the plant communities comprise hydrophytic vegetation, none of the area is a wetland. Complete the vegetation section for each DATA FORM 1.
- <u>STEP 3 - Determine Whether Wetland Hydrology Is Present.</u> When one of the following conditions applies (STEP 2), it is only necessary to confirm that there has been no recent hydrologic alteration of the area:

  <u>a</u>. The entire project area is occupied by a plant community or communities in which all dominant species are OBL (Appendix C, Section 1 or 2).

  <u>b</u>. The project area contains two or more plant communities, all of which are dominated by OBL and/or FACW species, and the wetland-nonwetland boundary is abrupt** (e.g. a *Spartina alterniflora* marsh bordered by a road embankment).

If either <u>a</u> or <u>b</u> applies, look for recorded evidence of recently constructed dikes, levees, impoundments, and drainage systems, or recent avalanches, mudslides, beaver dams, etc., that have significantly altered the area hydrology. If any significant hydrologic alteration is found, determine whether the area is still periodically inundated or

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* For the FAC-neutral option, see paragraph 35a.

** There must be documented evidence of periodic inundation or saturated soils when the project area:

<u>a</u>. Has plant communities dominated by one or more FAC species;
<u>b</u>. Has vegetation dominated by FACW species but no adjacent community dominated by OBL species;
<u>c</u>. Has a gradual, nondistinct boundary between wetlands and nonwetlands; and/or
<u>d</u>. Is known to have or is suspected of having significantly altered hydrology.

has saturated soils for sufficient duration to support the documented vegetation (a or b above). When a or b applies and there is no evidence of recent hydrologic alteration, or when a or b do not apply and there is documented evidence that the area is periodically inundated or has saturated soils, wetland hydrology is present. Otherwise, wetland hydrology does not occur on the area. Complete the hydrology section of DATA FORM 1 and PROCEED TO STEP 4.

- STEP 4 - Determine Whether the Soils Parameter Must Be Considered.

When either a or b of STEP 3 applies and there is either no evidence of recent hydrologic alteration of the project area or if wetland hydrology presently occurs on the area, hydric soils can be assumed to be present. If so, PROCEED TO STEP 6. Otherwise PROCEED TO STEP 5.

- STEP 5 - Determine Whether Hydric Soils Are Present. Examine the soils data (Section B, STEP 7) and record the soil series or soil phase on DATA FORM 1 for each community type. Determine whether the soil is listed as a hydric soil (Appendix D, Section 2). If all community types have hydric soils, the entire project area has hydric soils. *(CAUTION: If the soil series description makes reference to inclusions of other soil types, data must be field verified)*. Any portion of the area that lacks hydric soils is a nonwetland. Complete the soils section of each DATA FORM 1 and PROCEED TO STEP 6.

- STEP 6 - Wetland Determination. Examine the DATA FORM 1 for each community type. Any portion of the project area is a wetland that has:

  a. Hydrophytic vegetation that conforms to one of the conditions identified in STEP 3a or 3b and has either no evidence of altered hydrology or confirmed wetland hydrology.

  b. Hydrophytic vegetation that does not conform to STEP 3a or 3b, has hydric soils, and has confirmed wetland hydrology.

If STEP 6a or 6b applies to the entire project area, the entire area is a wetland. Complete a DATA FORM 1 for all plant community types. Portions of the area not qualifying as a wetland based on an office determination might or might not be wetlands. If the data used for the determination are considered to be highly reliable, portions of the area not qualifying as wetlands may properly be considered nonwetlands. PROCEED TO STEP 7. If the available data are incomplete or questionable, an onsite inspection (Subsection 2) will be required.

- STEP 7 - Determine Wetland Boundary. Mark on the base map all community types determined to be wetlands with a W and those determined to be nonwetlands with an N. Combine all wetland community types into a single mapping unit. The boundary of these community types is the interface between wetlands and nonwetlands.

Subsection 2 - Onsite Inspection Necessary

63. This subsection describes procedures for routine determinations in which the available information (Section B) is insufficient for one or more parameters. If only one or two parameters must be characterized, apply the appropriate steps and return to Subsection 1 and complete the determination. A flowchart of steps required for using this method is presented in Figure 14, and each step is described below.

Equipment and materials

64. The following equipment and materials will be needed:

a. Base map (Section B, STEP 2).
b. Copies of DATA FORM 1 (one for each community type and additional copies for boundary determinations).
c. Appendices C and D.
d. Compass.
e. Soil auger or spade (soils only).
f. Tape (300 ft).
g. Munsell Color Charts (Munsell Color 1975) (soils only).

Procedure

65. Complete the following steps, as necessary:

- STEP 1 - Locate the Project Area. Determine the spatial boundaries of the project area using information from a USGS quadrangle map or other appropriate map, aerial photography, and/or the project survey plan (when available). PROCEED TO STEP 2.
- STEP 2 - Determine Whether an Atypical Situation Exists. Examine the area and determine whether there is evidence of sufficient natural or human-induced alteration to significantly alter the area vegetation, soils, and/or hydrology. *NOTE: Include possible offsite modifications that may affect the area hydrology.* If not, PROCEED TO STEP 3.

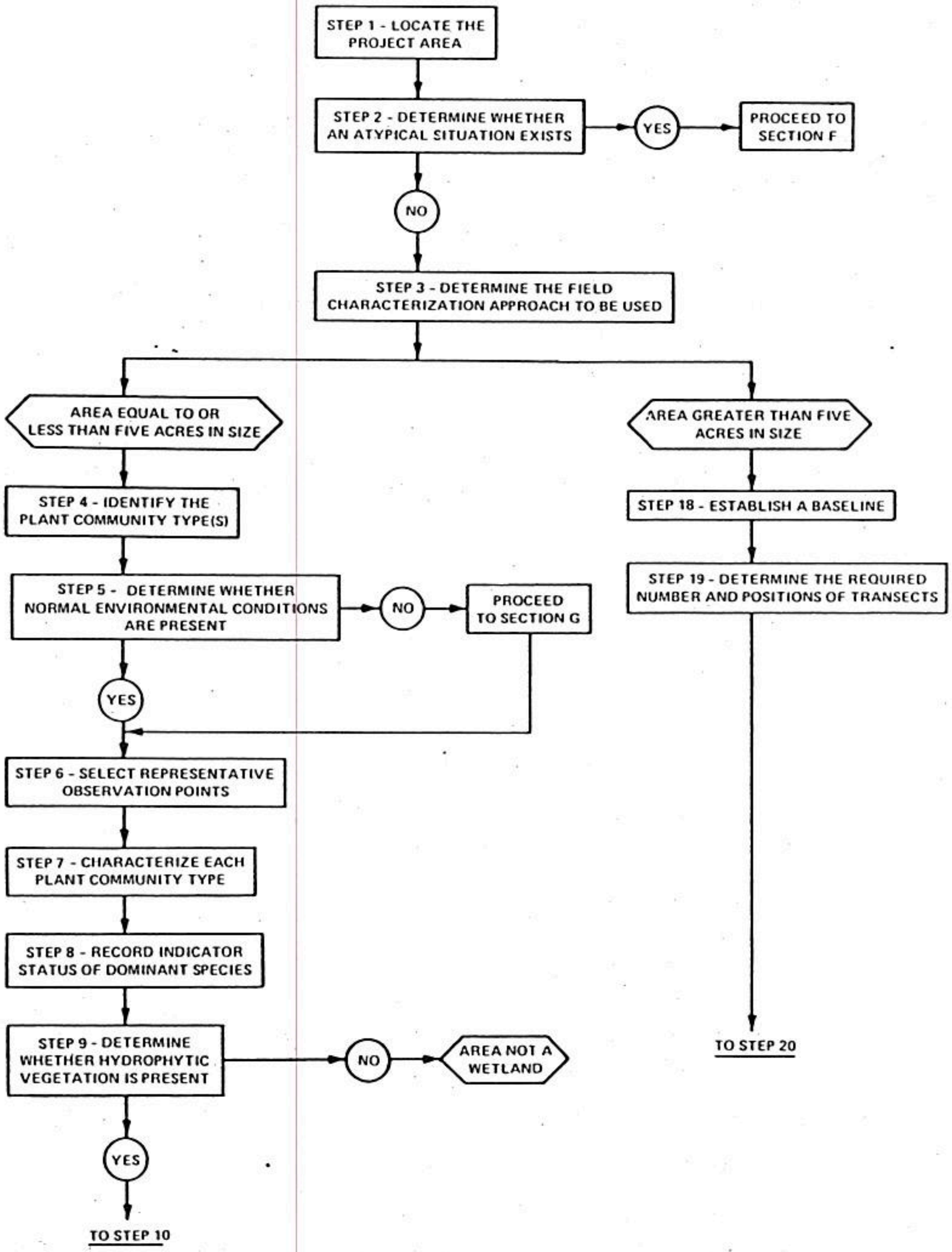

Figure 14. Flowchart of steps involved in making a routine wetland determination when an onsite visit is necessary (Continued)

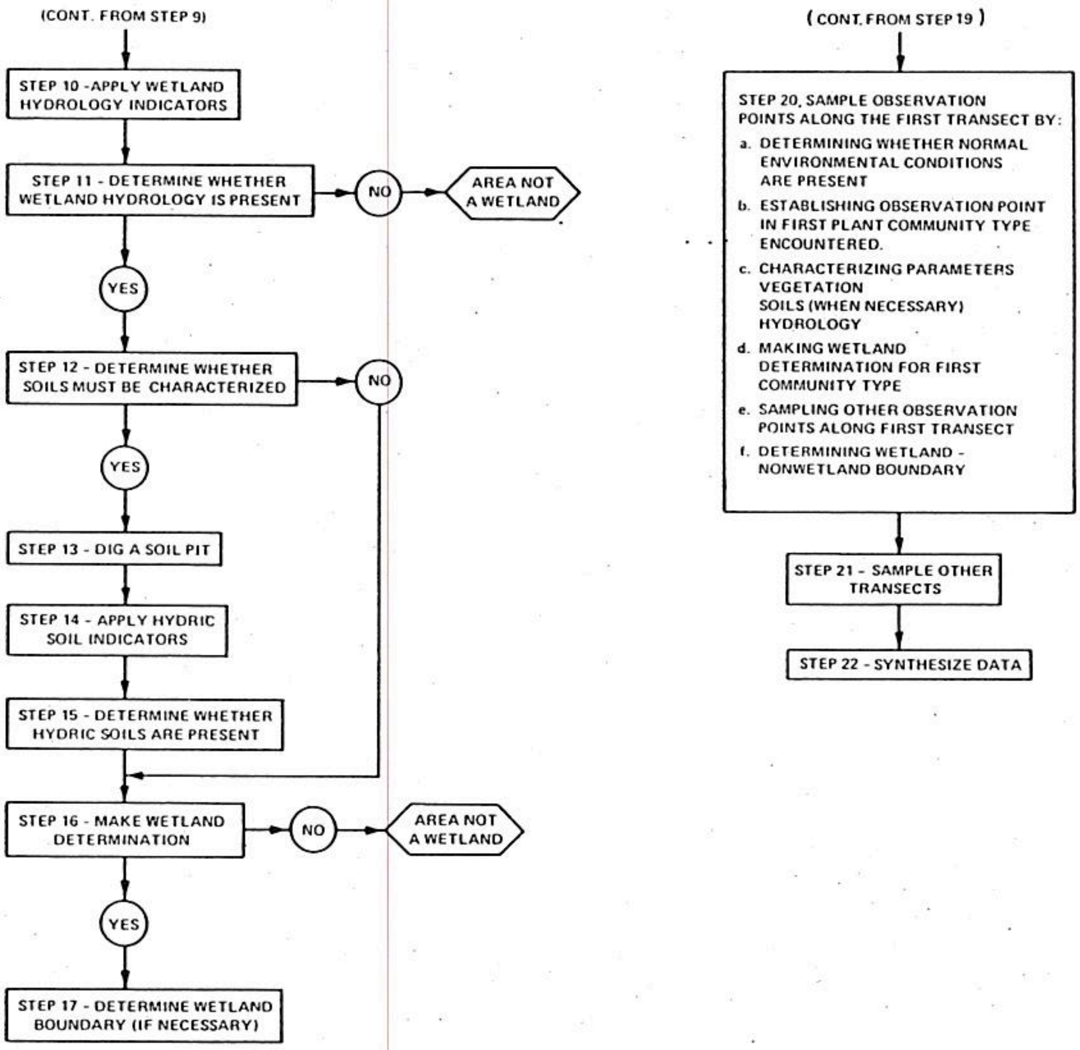

Figure 14. (Concluded)

If one or more parameters have been significantly altered by an activity that would normally require a permit, PROCEED TO Section F and determine whether there is sufficient evidence that hydrophytic vegetation, hydric soils, and/or wetland hydrology were present prior to this alteration. Then, return to this subsection and characterize parameters not significantly influenced by human activities. PROCEED TO STEP 3.

- <u>STEP 3 - Determine the Field Characterization Approach to be Used.</u> Considering the size and complexity of the area, determine the field characterization approach to be used. When the area is equal to or less than 5 acres in size (Section B, STEP 3) and the area is thought to be relatively homogeneous with respect to vegetation, soils, and/or hydrologic regime, PROCEED TO STEP 4. When the area is greater than 5 acres in size (Section B, STEP 3) or appears to be highly diverse with respect to vegetation, PROCEED TO STEP 18.

Areas Equal to or Less Than 5 Acres in Size

- <u>STEP 4 - Identify the Plant Community Type(s).</u> Traverse the area and determine the number and locations of plant community types. Sketch the location of each on the base map (Section B, STEP 2), and give each community type a name. PROCEED TO STEP 5.
- <u>STEP 5 - Determine Whether Normal Environmental Conditions Are Present.</u> Determine whether normal environmental conditions are present by considering the following:

  <u>a</u>. Is the area presently lacking hydrophytic vegetation or hydrologic indicators due to annual or seasonal fluctuations in precipitation or ground-water levels?

  <u>b</u>. Are hydrophytic vegetation indicators lacking due to seasonal fluctuations in temperature?

If the answer to either of these questions is thought to be YES, PROCEED TO Section G. If the answer to both questions is NO, PROCEED TO STEP 6.

- <u>STEP 6 - Select Representative Observation Points.</u> Select a representative observation point in each community type. A representative observation point is one in which the apparent characteristics (determine visually) best represent characteristics of the entire community.

Mark on the base map the approximate location of the observation point. PROCEED TO STEP 7.

- STEP 7 - Characterize Each Plant Community Type. Visually determine the dominant plant species in each vegetation layer of each community type and record them on DATA FORM 1 (use a separate DATA FORM 1 for each community type). Dominant species are those having the greatest relative basal area (woody overstory),* greatest height (woody understory), greatest percentage of areal cover (herbaceous understory), and/or greatest number of stems (woody vines). PROCEED TO STEP 8.
- STEP 8 - Record Indicator Status of Dominant Species. Record on DATA FORM 1 the indicator status (Appendix C, Section 1 or 2) of each dominant species in each community type. PROCEED TO STEP 9.
- STEP 9 - Determine Whether Hydrophytic Vegetation Is Present. Examine each DATA FORM 1. When more than 50 percent of the dominant species in a community type have an indicator status (STEP 8) of OBL, FACW, and/or FAC,** hydrophytic vegetation is present. Complete the vegetation section of each DATA FORM 1. Portions of the area failing this test are not wetlands. PROCEED TO STEP 10.
- STEP 10 - Apply Wetland Hydrologic Indicators. Examine the portion of the area occupied by each plant community type for positive indicators of wetland hydrology (PART III, paragraph 49). Record findings on the appropriate DATA FORM 1. PROCEED TO STEP 11.
- STEP 11 - Determine Whether Wetland Hydrology Is Present. Examine the hydrologic information on DATA FORM 1 for each plant community type. Any portion of the area having a positive wetland hydrology indicator has wetland hydrology. If positive wetland hydrology indicators are present in all community types, the entire area has wetland hydrology. If no plant community type has a wetland hydrology indicator, none of the area has wetland hydrology. Complete the hydrology portion of each DATA FORM 1. PROCEED TO STEP 12.

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* This term is used because species having the largest individuals may not be dominant when only a few are present. To determine relative basal area, consider both the size and number of individuals of a species and subjectively compare with other species present.

** For the FAC-neutral option, see paragraph 35a.

- STEP 12 - Determine Whether Soils Must Be Characterized. Examine the vegetation section of each DATA FORM 1. Hydric soils are assumed to be present in any plant community type in which:

  a. All dominant species have an indicator status of OBL.
  b. All dominant species have an indicator status of OBL or FACW, and the wetland boundary (when present) is abrupt.*

When either a or b occurs and wetland hydrology is present, check the hydric soils blank as positive on DATA FORM 1 and PROCEED TO STEP 16. If neither a nor b applies, PROCEED TO STEP 13.

- STEP 13 - Dig a Soil Pit. Using a soil auger or spade, dig a soil pit at the representative location in each community type. The procedure for digging a soil pit is described in Appendix D, Section 1. When completed, approximately 16 inches of the soil profile will be available for examination. PROCEED TO STEP 14.

- STEP 14 - Apply Hydric Soil Indicators. Examine the soil at each location and compare its characteristics immediately below the A-horizon or 10 inches (whichever is shallower) with the hydric soil indicators described in PART III, paragraphs 44 and/or 45. Record findings on the appropriate DATA FORM 1's. PROCEED TO STEP 15.

- STEP 15 - Determine Whether Hydric Soils Are Present. Examine each DATA FORM 1 and determine whether a positive hydric soil indicator was found. If so, the area at that location has hydric soil. If soils at all sampling locations have positive hydric soil indicators, the entire area has hydric soils. If soils at all sampling locations lack positive hydric soil indicators, none of the area is a wetland. Complete the soil section of each DATA FORM 1. PROCEED TO STEP 16.

- STEP 16 - Make Wetland Determination. Examine DATA FORM 1. If the entire area presently or normally has wetland indicators of all three parameters (STEPS 9, 11, and 15), the entire area is a wetland. If the entire area presently or normally lacks wetland indicators of one or

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* The soils parameter must be considered in any plant community in which:

a. The community is dominated by one or more FAC species.
b. No community type dominated by OBL species is present.
c. The boundary between wetlands and nonwetlands is gradual or nondistinct.
d. The area is known to or is suspected of having significantly altered hydrology.

more parameters, the entire area is a nonwetland. If only a portion of the area presently or normally has wetland indicators for all three parameters, PROCEED TO STEP 17.

- STEP 17 - Determine Wetland-Nonwetland Boundary. Mark each plant community type on the base map with a W if wetland or an N if nonwetland. Combine all wetland plant communities into one mapping unit and all nonwetland plant communities into another mapping unit. The wetland-nonwetland boundary will be represented by the interface of these two mapping units.

Areas Greater Than 5 Acres in Size

- STEP 18 - Establish a Baseline. Select one project boundary as a baseline. The baseline should parallel the major watercourse through the area or should be perpendicular to the hydrologic gradient (Figure 15). Determine the approximate baseline length. PROCEED TO STEP 19.
- STEP 19 - Determine the Required Number and Position of Transects. Use the following to determine the required number and position of transects (specific site conditions may necessitate changes in intervals):

Baseline length, miles	Number of Required Transects
≤0.25	3
>0.25-0.50	3
>0.50-0.75	3
>0.75-1.00	3
>1.00-2.00	3-5
>2.00-4.00	5-8
>4.00	8 or more*

* Transect intervals should not exceed 0.5 mile.

Divide the baseline length by the number of required transects. Establish one transect in each resulting baseline increment. Use the

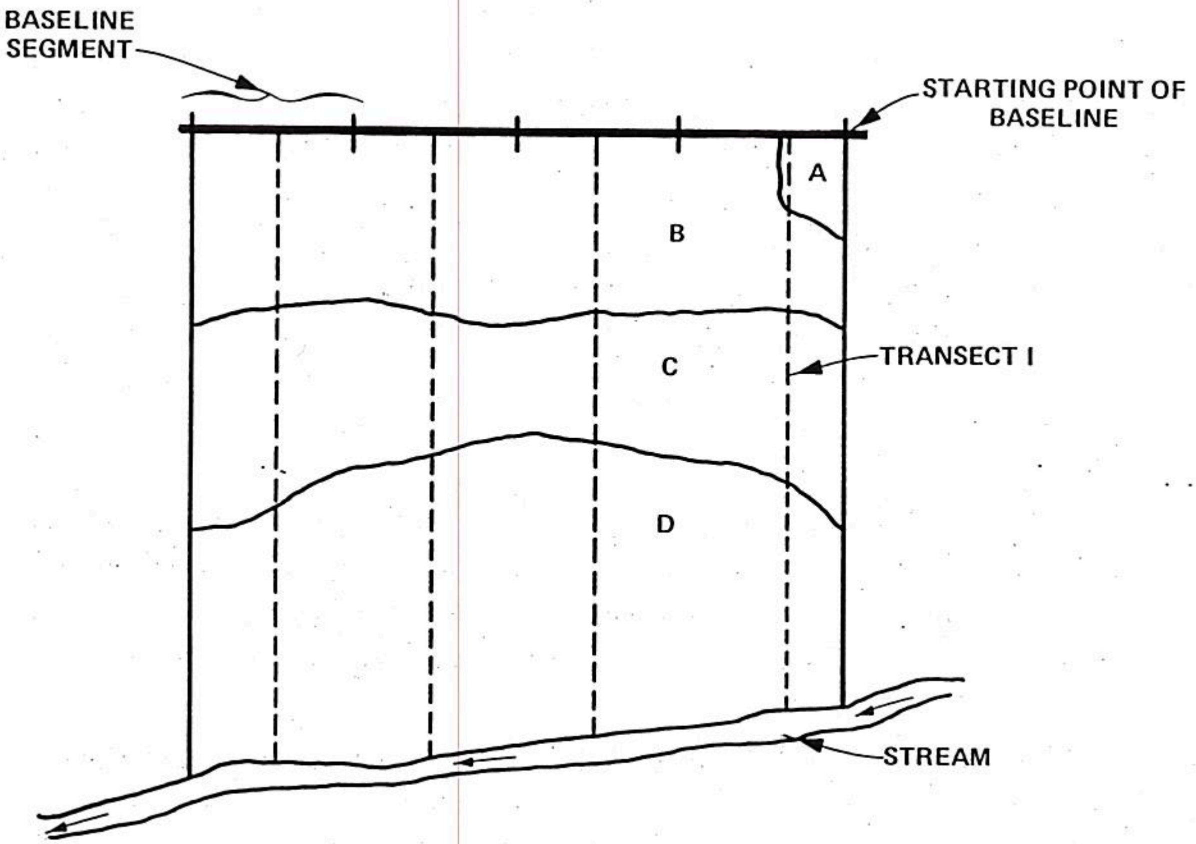

Figure 15. General orientation of baseline and transects (dotted lines) in a hypothetical project area. Alpha characters represent different plant communities. All transects start at the midpoint of a baseline segment except the first, which was repositioned to include community type A

midpoint of each baseline increment as a transect starting point. For example, if the baseline is 1,200 ft in length, three transects would be established--one at 200 ft, one at 600 ft, and one at 1,000 ft from the baseline starting point. *CAUTION: All plant community types must be included. This may necessitate relocation of one or more transect lines.* PROCEED TO STEP 20.

- STEP 20 - Sample Observation Points Along the First Transect. Beginning at the starting point of the first transect, extend the transect at a 90-deg angle to the baseline. Use the following procedure as appropriate to simultaneously characterize the parameters at each observation point. Combine field-collected data with information already available and make a wetland determination at each observation point. A DATA FORM 1 must be completed for each observation point.

a. Determine whether normal environmental conditions are present. Determine whether normal environmental conditions are present by considering the following:

(1) Is the area presently lacking hydrophytic vegetation and/or hydrologic indicators due to annual or seasonal fluctuations in precipitation or ground-water levels?

(2) Are hydrophytic vegetation indicators lacking due to seasonal fluctuations in temperature?

If the answer to either of these questions is thought to be YES, PROCEED TO Section G. If the answer to both questions is NO, PROCEED TO STEP 20b.

b. Establish an observation point in the first plant community type encountered. Select a representative location along the transect in the first plant community type encountered. When the first plant community type is large and covers a significant distance along the transect, select an area that is no closer than 300 ft to a perceptible change in plant community type. PROCEED TO STEP 20c.

c. Characterize parameters. Characterize the parameters at the observation point by completing (1), (2), and (3) below:

(1) Vegetation. Record on DATA FORM 1 the dominant plant species in each vegetation layer occurring in the immediate vicinity of the observation point. Use a 5-ft radius for herbs and saplings/shrubs, and a 30-ft radius for trees and woody vines (when present). Subjectively determine the dominant species by estimating those having the largest relative basal area* (woody overstory), greatest height (woody understory), greatest percentage of areal cover (herbaceous understory), and/or greatest number of stems (woody vines). *NOTE: Plot size may be estimated, and plot size may also be varied when site conditions warrant.* Record on DATA FORM 1 any dominant species observed to have morphological adaptations (Appendix C, Section 3) for occurrence in wetlands, and determine and record dominant species that have known physiological adaptations for occurrence in wetlands (Appendix C, Section 3). Record on DATA FORM 1 the indicator status (Appendix C, Section 1 or 2) of each dominant species. Hydrophytic vegetation is present at the observation point when more than 50 percent of the dominant species have an indicator status of OBL, FACW, and/or FAC**; when two or more dominant species have observed morphological or known physiological adaptations for occurrence in wetlands; or when other indicators of hydrophytic vegetation (PART III, paragraph 35) are

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* This term is used because species having the largest individuals may not be dominant when only a few are present. To use relative basal area, consider both the size and number of individuals of a species and subjectively compare with other species present.

** For the FAC-neutral option, see paragraph 35a.

present. Complete the vegetation section of DATA FORM 1. PROCEED TO (2).

(2) Soils. In some cases, it is not necessary to characterize the soils. Examine the vegetation of DATA FORM 1. Hydric soils can be assumed to be present when:

(a) All dominant plant species have an indicator status of OBL.

(b) All dominant plant species have an indicator status of OBL and/or FACW (at least one dominant species must be OBL).*

When either (a) or (b) applies, check the hydric soils blank as positive and PROCEED TO (3). If neither (a) nor (b) applies but the vegetation qualifies as hydrophytic, dig a soil pit at the observation point using the procedure described in Appendix D, Section 1. Examine the soil immediately below the A-horizon or 10-inches (whichever is shallower) and compare its characteristics (Appendix D, Section 1) with the hydric soil indicators described in PART III, paragraphs 44 and/or 45. Record findings on DATA FORM 1. If a positive hydric soil indicator is present, the soil at the observation point is a hydric soil. If no positive hydric soil indicator is found, the area at the observation point does not have hydric soils and the area at the observation point is not a wetland. Complete the soils section of DATA FORM 1 for the observation point. PROCEED TO (3) if hydrophytic vegetation (1) and hydric soils (2) are present. Otherwise, PROCEED TO STEP 20d.

(3) Hydrology. Examine the observation point for indicators of wetland hydrology (PART III, paragraph 49), and record observations on DATA FORM 1. Consider the indicators in the same sequence as presented in PART III, paragraph 49. If a positive wetland hydrology indicator is present, the area at the observation point has wetland hydrology. If no positive wetland hydrologic indicator is present, the area at the observation point is not a wetland. Complete the hydrology section of DATA FORM 1 for the observation point. PROCEED TO STEP 20d.

d. Wetland determination. Examine DATA FORM 1 for the observation point. Determine whether wetland indicators of all three parameters are or would normally be present during a significant portion of the growing season. If so, the area at the observation point is a wetland. If no evidence can be found that the area at the observation point normally has wetland indicators for all three parameters, the area is a nonwetland. PROCEED TO STEP 20e.

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* Soils must be characterized when any dominant species has an indicator status of FAC.

e. Sample other observation points along the first transect. Continue along the first transect until a different community type is encountered. Establish a representative observation point within this community type and repeat STEP 20c - 20d. If the areas at both observation points are either wetlands or nonwetlands, continue along the transect and repeat STEP 20c - 20d for the next community type encountered. Repeat for all other community types along the first transect. If the area at one observation point is wetlands and the next observation point is nonwetlands (or vice versa), PROCEED TO STEP 20f.

f. Determine wetland-nonwetland boundary. Proceed along the transect from the wetland observation point toward the nonwetland observation point. Look for subtle changes in the plant community (e.g. the first appearance of upland species, disappearance of apparent hydrology indicators, or slight changes in topography). When such features are noted, establish an observation point and repeat the procedures described in STEP 20c - 20d. *NOTE: A new DATA FORM 1 must be completed for this observation point, and all three parameters must be characterized by field observation.* If the area at this observation point is a wetland, proceed along the transect toward the nonwetland observation point until upland indicators are more apparent. Repeat the procedures described in STEP 20c - 20d. If the area at this observation point is a nonwetland, move halfway back along the transect toward the last documented wetland observation point and repeat the procedure described in STEP 20c - 20d. Continue this procedure until the wetland-nonwetland boundary is found. It is not necessary to complete a DATA FORM 1 for all intermediate points, but a DATA FORM 1 should be completed for the wetland-nonwetland boundary. Mark the position of the wetland boundary on the base map, and continue along the first transect until all community types have been sampled and all wetland boundaries located. *CAUTION: In areas where wetlands are interspersed among nonwetlands (or vice versa), several boundary determinations will be required.* When all necessary wetland determinations have been completed for the first transect, PROCEED TO STEP 21.

- STEP 21 - Sample Other Transects. Repeat procedures described in STEP 21 for all other transects. When completed, a wetland determination will have been made for one observation point in each community type along each transect, and all wetland-nonwetland boundaries along each transect will have been determined. PROCEED TO STEP 22.
- STEP 22 - Synthesize Data. Examine all completed copies of DATA FORM 1, and mark each plant community type on the base map. Identify each plant community type as either a wetland (W) or nonwetland (N). If all plant community types are identified as wetlands, the entire area is wetlands. If all plant community types are identified as

nonwetlands, the entire area is nonwetlands. If both wetlands and nonwetlands are present, identify observation points that represent wetland boundaries on the base map. Connect these points on the map by generally following contour lines to separate wetlands from nonwetlands. Walk the contour line between transects to confirm the wetland boundary. Should anomalies be encountered, it will be necessary to establish short transects in these areas, apply the procedures described in STEP 20f, and make any necessary adjustments on the base map.

Subsection 3 - Combination of Levels 1 and 2

66. In some cases, especially for large projects, adequate information may already be available (Section B) to enable a wetland determination for a portion of the project area, while an onsite visit will be required for the remainder of the area. Since procedures for each situation have already been described in Subsections 1 and 2, they will not be repeated. Apply the following steps:

- STEP 1 - Make Wetland Determination for Portions of the Project Area That Are Already Adequately Characterized. Apply procedures described in Subsection 1. When completed, a DATA FORM 1 will have been completed for each community type, and a map will have been prepared identifying each community type as wetland or nonwetland and showing any wetland boundary occurring in this portion of the project area. PROCEED TO STEP 2.
- STEP 2 - Make Wetland Determination for Portions of the Project Area That Require an Onsite Visit. Apply procedures described in Subsection 2. When completed, a DATA FORM 1 will have been completed for each plant community type or for a number of observation points (including wetland boundary determinations). A map of the wetland (if present) will also be available. PROCEED TO STEP 3.
- STEP 3 - Synthesize Data. Using the maps resulting from STEPS 1 and 2, prepare a summary map that shows the wetlands of the entire project area. *CAUTION: Wetland boundaries for the two maps will not always match exactly. When this occurs, an additional site visit will be required to refine the wetland boundaries. Since the degree of*

resolution of wetland boundaries will be greater when determined on-site, it may be necessary to employ procedures described in Subsection 2 in the vicinity of the boundaries determined from Subsection 1 to refine these boundaries.

Section E. Comprehensive Determinations

67. This section describes procedures for making comprehensive wetland determinations. Unlike procedures for making routine determinations (Section D), application of procedures described in this section will result in maximum information for use in making determinations, and the information usually will be quantitatively expressed. Comprehensive determinations should only be used when the project area is very complex and/or when the determination requires rigorous documentation. This type of determination may be required in areas of any size, but will be especially useful in large areas. There may be instances in which only one parameter (vegetation, soil, or hydrology) is disputed. In such cases, only procedures described in this section that pertain to the disputed parameter need be completed. It is assumed that the user has already completed all applicable steps in Section B. *NOTE: Depending on site characteristics, it may be necessary to alter the sampling design and/or data collection procedures.*

68. This section is divided into five basic types of activities. The first consists of preliminary field activities that must be completed prior to making a determination (STEPS 1-5). The second outlines procedures for determining the number and locations of required determinations (STEPS 6-8). The third describes the basic procedure for making a comprehensive wetland determination at any given point (STEPS 9-17). The fourth describes a procedure for determining wetland boundaries (STEP 18). The fifth describes a procedure for synthesizing the collected data to determine the extent of wetlands in the area (STEPS 20-21). A flowchart showing the relationship of various steps required for making a comprehensive determination is presented in Figure 16.

Equipment and material

69. Equipment and materials needed for making a comprehensive determination include:

a. Base map (Section B, STEP 2).
b. Copies of DATA FORMS 1 and 2.
c. Appendices C and D.
d. Compass.
e. Tape (300 ft).
f. Soil auger or spade.
g. Munsell Color Charts (Munsell Color 1975).

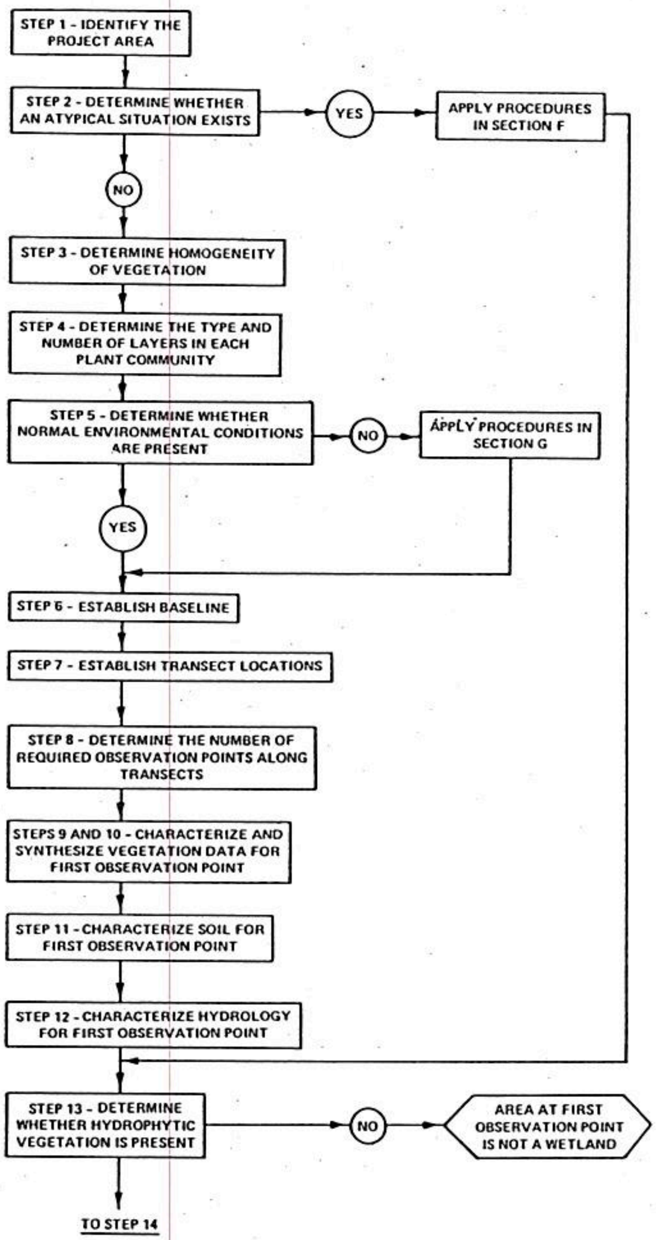

Figure 16. Flowchart of steps involved in making a comprehensive wetland determination (Section E) (Continued)

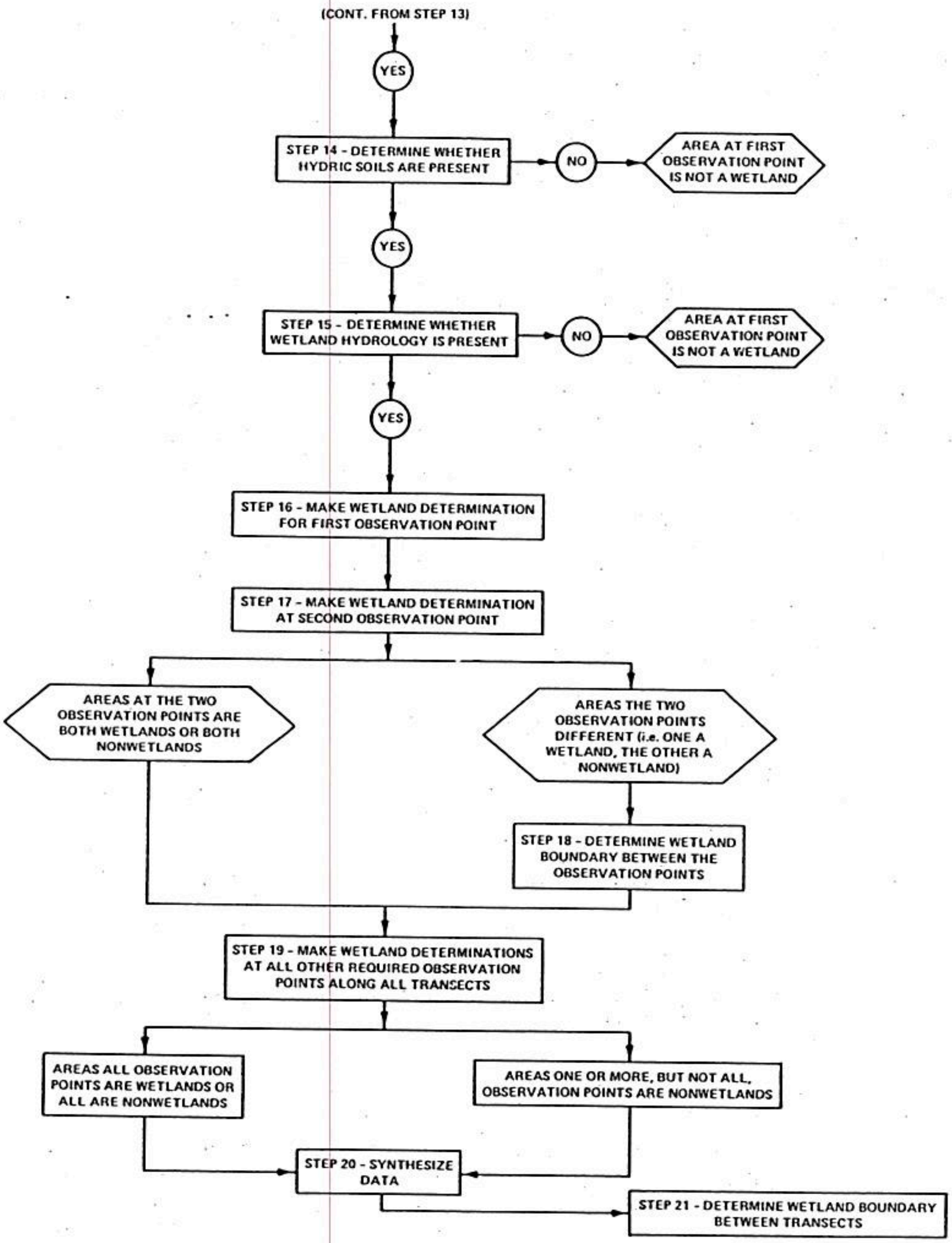

Figure 16. (Concluded)

h. Quadrat (3.28 ft by 3.28 ft).

i. Diameter or basal area tape (for woody overstory).

Field procedures

70. Complete the following steps:

- STEP 1 - Identify the Project Area. Using information from the USGS quadrangle or other appropriate map (Section B), locate and measure the spatial boundaries of the project area. Determine the compass heading of each boundary and record on the base map (Section B, STEP 2). The applicant's survey plan may be helpful in locating the project boundaries. PROCEED TO STEP 2.

- STEP 2 - Determine Whether an Atypical Situation Exists. Examine the area and determine whether there is sufficient natural or human-induced alteration to significantly change the area vegetation, soils, and/or hydrology. If not, PROCEED TO STEP 3. If one or more parameters have been recently altered significantly, PROCEED TO Section F and determine whether there is sufficient evidence that hydrophytic vegetation, hydric soils, and/or wetland hydrology were present on the area prior to alteration. Then return to this section and characterize parameters not significantly influenced by human activities. PROCEED TO STEP 3.

- STEP 3 - Determine Homogeneity of Vegetation. While completing STEP 2, determine the number of plant community types present. Mark the approximate location of each community type on the base map. The number and locations of required wetland determinations will be strongly influenced by both the size of the area and the number and distribution of plant community types; the larger the area and greater the number of plant community types, the greater the number of required wetland determinations. It is imperative that all plant community types occurring in all portions of the area be included in the investigation. PROCEED TO STEP 4.

- STEP 4 - Determine the Type and Number of Layers in Each Plant Community. Examine each identified plant community type and determine the type(s) and number of layers in each community. Potential layers include trees (woody overstory), saplings/shrubs (woody understory), herbs (herbaceous understory), and/or woody vines. PROCEED TO STEP 5.

- STEP 5 - Determine Whether Normal Environmental Conditions Are Present. Determine whether normal environmental conditions are present at the observation point by considering the following:

- a. Is the area at the observation point presently lacking hydrophytic vegetation and/or hydrologic indicators due to annual or seasonal fluctuations in precipitation or groundwater levels?
- b. Are hydrophytic vegetation indicators lacking due to seasonal fluctuations in temperature?

If the answer to either of these questions is thought to be YES, PROCEED TO Section G. If the answer to both questions is NO, PROCEED TO STEP 6.

● STEP 6 - Establish a Baseline. Select one project boundary area as a baseline. The baseline should extend parallel to any major watercourse and/or perpendicular to a topographic gradient (see Figure 17). Determine the baseline length and record on the base map both the baseline length and its compass heading. PROCEED TO STEP 7.

● STEP 7. Establish Transect Locations. Divide the baseline into a number of equal segments (Figure 17). Use the following as a guide to determine the appropriate number of baseline segments:

Baseline Length, ft	Number of Segments	Length of Baseline Segment, ft
>50 - 500	3	18 - 167
>500 - 1,000	3	167 - 333
>1,000 - 5,000	5	200 - 1,000
>5,000 - 10,000	7	700 - 1,400
>10,000*	variable	2,000

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* If the baseline exceeds 5 miles, baseline segments should be 0.5 mile in length.

Use a random numbers table or a calculator with a random numbers generation feature to determine the position of a transect starting point within each baseline segment. For example, when the baseline is 4,000 ft, the number of baseline segments will be five, and the baseline segment length will be 4,000/5 = 800 ft. Locate the first transect within the first 800 ft of the baseline. If the random numbers table yields 264 as the distance from the baseline starting point, measure 264 ft from the baseline starting point and establish the starting point of the first transect. If the second random number selected is

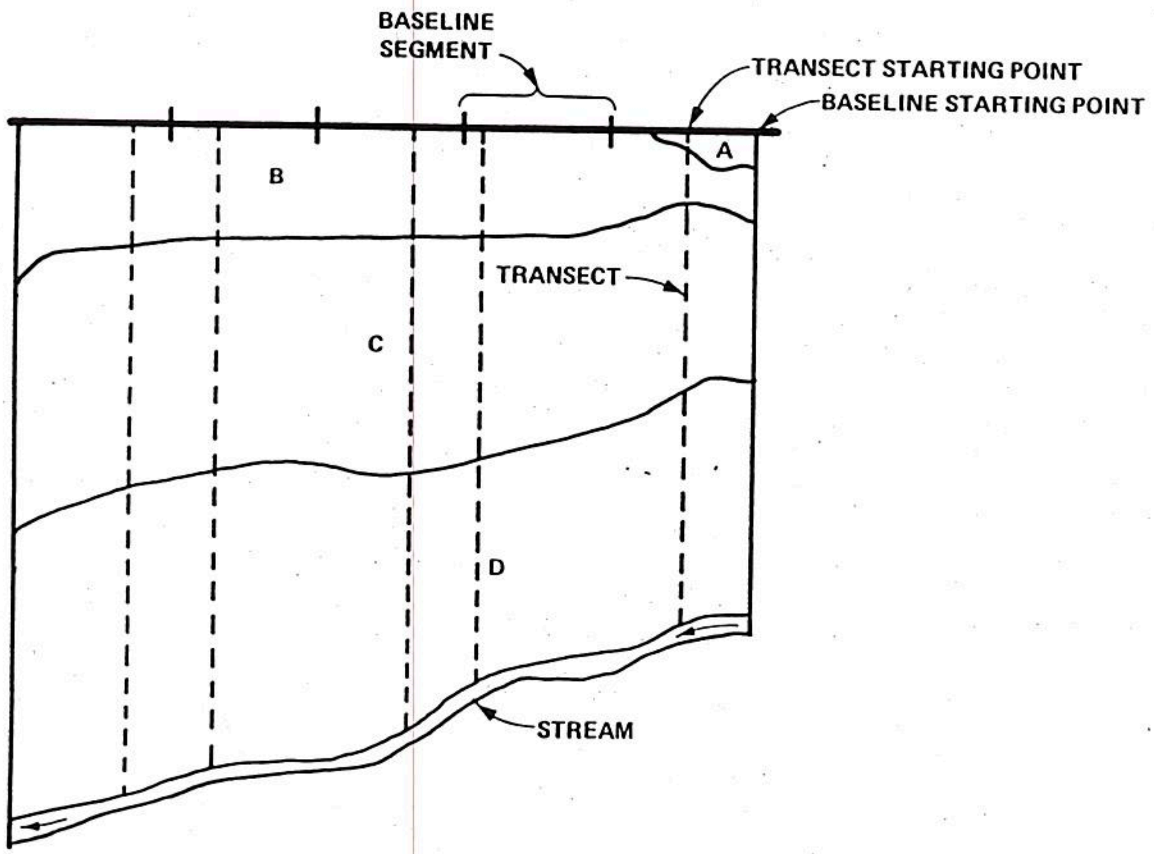

Figure 17. General orientation of baseline and transects in a hypothetical project area. Alpha characters represent different plant communities. Transect positions were determined using a random numbers table

530, the starting point of the second transect will be located at a distance of 1,330 ft (800 + 530 ft) from the baseline starting point. *CAUTION: Make sure that each plant community type is included in at least one transect. If not, modify the sampling design accordingly.* When the starting point locations for all required transects have been determined, PROCEED TO STEP 8.

- <u>STEP 8 - Determine the Number of Required Observation Points Along Transects.</u> The number of required observation points along each transect will be largely dependent on transect length. Establish observation points along each transect using the following as a guide:

Transect Length, ft	Number of Observation Points	Interval Between Observation Points, ft
<1,000	2-10	100
1,000 - <5,000	10	100 - 500
5,000 - <10,000	10	500 - 1,000
≥10,000	>10	1,000

Establish the first observation point at a distance of 50 ft from the baseline (Figure 17). When obvious nonwetlands occupy a long portion of the transect from the baseline starting point, establish the first observation point in the obvious nonwetland at a distance of approximately 300 ft from the point that the obvious nonwetland begins to intergrade into a potential wetland community type. Additional observation points must also be established to determine the wetland boundary between successive regular observation points when one of the points is a wetland and the other is a nonwetland. *CAUTION: In large areas having a mosaic of plant community types, several wetland boundaries may occur along the same transect.* PROCEED TO STEP 9 and apply the comprehensive wetland determination procedure at each required observation point. Use the described procedure to simultaneously characterize the vegetation, soil, and hydrology at each required observation point along each transect, and use the resulting characterization to make a wetland determination at each point. *NOTE: All required wetland boundary determinations should be made while proceeding along a transect.*

- STEP 9 - Characterize the Vegetation at the First Observation Point Along the First Transect.* Record on DATA FORM 2 the vegetation occurring at the first observation point along the first transect by completing the following (as appropriate):

  a. Trees. Identify each tree occurring within a 30-ft radius** of the observation point, measure its basal area (square inches) or diameter at breast height (DBH) using a basal area tape or

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* There is no single best procedure for characterizing vegetation. Methods described in STEP 9 afford standardization of the procedure. However, plot size and descriptors for determining dominance may vary.

** A larger sampling plot may be necessary when trees are large and widely spaced.

diameter tape, respectively, and record. *NOTE: If DBH is measured, convert values to basal area by applying the formula* $A = \pi r^2$. *This must be done on an individual basis.* A tree is any nonclimbing, woody plant that has a DBH of $\geq$3.0 in., regardless of height.

b. Saplings/shrubs. Identify each sapling/shrub occurring within a 10-ft radius of the observation point, estimate its height, and record the midpoint of its class range using the following height classes (height is used as an indication of dominance; taller individuals exert a greater influence on the plant community):

Height Class	Height Class Range, ft	Midpoint of Range, ft
1	1 - 3	2
2	3 - 5	4
3	5 - 7	6
4	7 - 9	8
5	9 - 11	10
6	>11	12

A sapling/shrub is any woody plant having a height >3.2 ft but a stem diameter of <3.0 in., exclusive of woody vines.

c. Herbs. Place a 3.28- by 3.28-ft quadrat with one corner touching the observation point and one edge adjacent to the transect line. As an alternative, a 1.64-ft-radius plot with the center of the plot representing the observation point position may be used. Identify each plant species with foliage extending into the quadrat and estimate its percent cover by applying the following cover classes:

Cover Class	Class Range, %	Midpoint of Class Range, %
1	0 - 5	2.5
2	>5 - 25	15.0
3	>25 - 50	37.5
4	>50 - 75	62.5
5	>75 - 95	85.0
6	>95 - 100	97.5

Include all nonwoody plants and woody plants <3.2 ft in height. *NOTE: Total percent cover for all species will often exceed 100 percent.*

d. Woody vines (lianas). Identify species of woody vines climbing each tree and sapling/shrub sampled in STEPS 9a and 9b above, and record the number of stems of each. Since many woody vines branch profusely, count or estimate the number of stems at the ground surface. Include only individuals rooted in the 10-ft radius plot. Do not include individuals <3.2 ft in height. PROCEED TO STEP 10.

• STEP 10 - Analyze Field Vegetation Data. Examine the vegetation data (STEP 9) and determine the dominant species in each vegetation layer* by completing the following:

a. Trees. Obtain the total basal area (square inches) for each tree species identified in STEP 9a by summing the basal area of all individuals of a species found in the sample plot. Rank the species in descending order of dominance based on total basal area. Complete DATA FORM 2 for the tree layer.

b. Saplings/shrubs. Obtain the total height for each sapling/shrub species identified in STEP 9b. Total height, which is an estimate of dominance, is obtained by summing the midpoints of height classes for all individuals of a species found in the sample plot. Rank the species in descending order of dominance based on sums of midpoints of height class ranges. Complete DATA FORM 2 for the sapling/shrub layer.

c. Herbs. Obtain the total cover for each herbaceous and woody seedling species identified in STEP 9c. Total cover is obtained by using the midpoints of the cover class range assigned to each species (only one estimate of cover is made for a species in a given plot). Rank herbs and woody seedlings in descending order of dominance based on percent cover. Complete DATA FORM 2 for the herbaceous layer.

d. Woody vines (lianas). Obtain the total number of individuals of each species of woody vine identified in STEP 9d. Rank the species in descending order of dominance based on number of stems. Complete DATA FORM 2 for the woody vine layer. PROCEED TO STEP 11.

• STEP 11 - Characterize Soil. If a soil survey is available (Section B), the soil type may already be known. Have a soil scientist confirm that the soil type is correct, and determine whether the soil series is a hydric soil (Appendix D, Section 2). *CAUTION: Mapping units on soil surveys sometimes have inclusions of soil series or phases not shown on the soil survey map.* If a hydric soil type is confirmed, record on DATA FORM 1 and PROCEED TO STEP 12. If not, dig a soil pit using a soil auger or spade (See Appendix D, Section 1) and

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* The same species may occur as a dominant in more than one vegetation layer.

look for indicators of hydric soils immediately below the A-horizon or 10 inches (whichever is shallower) (PART III, paragraphs 44 and/or 45). Record findings on DATA FORM 1. PROCEED TO STEP 12.

- STEP 12 - Characterize Hydrology. Examine the observation point for indicators of wetland hydrology (PART III, paragraph 49), and record observations on DATA FORM 1. Consider indicators in the same sequence as listed in paragraph 49. PROCEED TO STEP 13.

- STEP 13 - Determine Whether Hydrophytic Vegetation Is Present. Record the three dominant species from each vegetation layer (five species if only one or two layers are present) on DATA FORM 1.* Determine whether these species occur in wetlands by considering the following:

  a. More than 50 percent of the dominant plant species are OBL, FACW, and/or FAC** on lists of plant species that occur in wetlands. Record the indicator status of all dominant species (Appendix C, Section 1 or 2) on DATA FORM 1. Hydrophytic vegetation is present when the majority of the dominant species have an indicator status of OBL, FACW, or FAC. *CAUTION: Not necessarily all plant communities composed of only FAC species are hydrophytic communities. They are hydrophytic communities only when positive indicators of hydric soils and wetland hydrology are also found.* If this indicator is satisfied, complete the vegetation portion of DATA FORM 1 and PROCEED TO STEP 14. If not, consider other indicators of hydrophytic vegetation.

  b. Presence of adaptations for occurrence in wetlands. Do any of the species listed on DATA FORM 1 have observed morphological or known physiological adaptations (Appendix C, Section 3) for occurrence in wetlands? If so, record species having such adaptations on DATA FORM 1. When two or more dominant species have observed morphological adaptations or known physiological adaptations for occurrence in wetlands, hydrophytic vegetation is present. If so, complete the vegetation portion of DATA FORM 1 and PROCEED TO STEP 14. If not, consider other indicators of hydrophytic vegetation.

  c. Other indicators of hydrophytic vegetation. Consider other indicators (see PART III, paragraph 35) that the species listed on DATA FORM 1 are commonly found in wetlands. If so, complete the vegetation portion of DATA FORM 1 by recording sources of supporting information, and PROCEED TO STEP 14. If no indicator of hydrophytic vegetation is present, the area at the observation point is not a wetland. In such cases, it is

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* Record all dominant species when less than three are present in a vegetation layer.

** For the FAC-neutral option, see paragraph 35a.

unnecessary to consider soil and hydrology at that observation point. PROCEED TO STEP 17.

- STEP 14 - Determine Whether Hydric Soils Are Present. Examine DATA FORM 1 and determine whether any indicator of hydric soils is present. If so, complete the soils portion of DATA FORM 1 and PROCEED TO STEP 15. If not, the area at the observation point is not a wetland. PROCEED TO STEP 17.

- STEP 15 - Determine Whether Wetland Hydrology Is Present. Examine DATA FORM 1 and determine whether any indicator of wetland hydrology is present. Complete the hydrology portion of DATA FORM 1 and PROCEED TO STEP 16.

- STEP 16 - Make Wetland Determination. When the area at the observation point presently or normally has wetland indicators of all three parameters, it is a wetland. When the area at the observation point presently or normally lacks wetland indicators of one or more parameters, it is a nonwetland. PROCEED TO STEP 17.

- STEP 17 - Make Wetland Determination at Second Observation Point. Locate the second observation point along the first transect and make a wetland determination by repeating procedures described in STEPS 9-16. When the area at the second observation point is the same as the area at the first observation point (i.e. both wetlands or both nonwetlands), PROCEED TO STEP 19. When the areas at the two observation points are different (i.e. one wetlands, the other nonwetlands), PROCEED TO STEP 18.

- STEP 18 - Determine the Wetland Boundary Between Observation Points. Determine the position of the wetland boundary by applying the following procedure:

  a. Look for a change in vegetation or topography. *NOTE: The changes may sometimes be very subtle.* If a change is noted, establish an observation point and repeat STEPS 9-16. Complete a DATA FORM 1. If the area at this point is a wetland, proceed toward the nonwetland observation point until a more obvious change in vegetation or topography is noted and repeat the procedure. If there is no obvious change, establish the next observation point approximately halfway between the last observation point and the nonwetland observation point and repeat STEPS 9-16.

  b. Make as many additional wetland determinations as necessary to find the wetland boundary. *NOTE: The completed DATA FORM 1's* *for the original two observation points often will provide a clue as to the parameter(s) that change between the two points.*

c. When the wetland boundary is found, mark the boundary location on the base map and indicate on the DATA FORM 1 that this represents a wetland boundary. Record the distance of the boundary from one of the two regular observation points. Since the regular observation points represent known distances from the baseline, it will be possible to accurately pinpoint the boundary location on the base map. PROCEED TO STEP 19.

- STEP 19 - Make Wetland Determinations at All Other Required Observation Points Along All Transects. Continue to locate and sample all required observation points along all transects. *NOTE: The procedure described in STEP 18 must be applied at every position where a wetland boundary occurs between successive observation points.* Complete a DATA FORM 1 for each observation point and PROCEED TO STEP 20.

- STEP 20 - Synthesize Data to Determine the Portion of the Area Containing Wetlands. Examine all completed copies of DATA FORM 1 (STEP 19), and mark on a copy of the base map the locations of all observation points that are wetlands with a W and all observation points that are nonwetlands with an N. Also, mark all wetland boundaries occurring along transects with an X. If all the observation points are wetlands, the entire area is wetlands. If all observation points are nonwetlands, none of the area is wetlands. If some wetlands and some nonwetlands are present, connect the wetland boundaries (X) by following contour lines between transects. *CAUTION: If the determination is considered to be highly controversial, it may be necessary to be more precise in determining the wetland boundary between transects. This is also true for very large areas where the distance between transects is greater. If this is necessary, PROCEED TO STEP 21.*

- STEP 21 - Determine Wetland Boundary Between Transects. Two procedures may be used to determine the wetland boundary between transects, both of which involve surveying:

a. Survey contour from wetland boundary along transects. The first method involves surveying the elevation of the wetland boundaries along transects and then extending the survey to determine the same contour between transects. This procedure will be adequate in areas where there is no significant elevational change between transects. However, if a significant elevational change occurs between transects, either the surveyor must adjust elevational readings to accommodate such changes or the second method must be used. *NOTE: The surveyed* *wetland boundary must be examined to ensure that no anomalies exist. If these occur, additional wetland determinations will be required in the portion of the area where the anomalies occur, and the wetland boundary must be adjusted accordingly.*

b. Additional wetland determinations between transects. This procedure consists of traversing the area between transects and making additional wetland determinations to locate the wetland boundary at sufficiently close intervals (not necessarily standard intervals) so that the area can be surveyed. Place surveyor flags at each wetland boundary location. Enlist a surveyor to survey the points between transects. From the resulting survey data, produce a map that separates wetlands from nonwetlands.

Section F. Atypical Situations

71. Methods described in this section should be used only when a determination has already been made in Section D or E that positive indicators of hydrophytic vegetation, hydric soils, and/or wetland hydrology could not be found due to effects of recent human activities or natural events. This section is applicable to delineations made in the following types of situations:

a. Unauthorized activities. Unauthorized discharges requiring enforcement actions may result in removal or covering of indicators of one or more wetland parameters. Examples include, but are not limited to: (1) alteration or removal of vegetation; (2) placement of dredged or fill material over hydric soils; and/or (3) construction of levees, drainage systems, or dams that significantly alter the area hydrology. *NOTE: This section should not be used for activities that have been previously authorized or those that are exempted from CE regulation. For example, this section is not applicable to areas that have been drained under CE authorization or that did not require CE authorization. Some of these areas may still be wetlands, but procedures described in Section D or E must be used in these cases.*

b. Natural events. Naturally occurring events may result in either creation or alteration of wetlands. For example, recent beaver dams may impound water, thereby resulting in a shift of hydrology and vegetation to wetlands. However, hydric soil indicators may not have developed due to insufficient time having passed to allow their development. Fire, avalanches, volcanic activity, and changing river courses are other examples. *NOTE: It is necessary to determine whether alterations to an area have resulted in changes that are now the "normal circumstances."* The relative permanence of the change and whether the area is now functioning as a wetland must be considered.

c. Man-induced wetlands. Procedures described in Subsection 4 are for use in delineating wetlands that have been purposely or incidentally created by human activities, but in which wetland indicators of one or more parameters are absent. For example, road construction may have resulted in impoundment of water in an area that previously was nonwetland, thereby effecting hydrophytic vegetation and wetland hydrology in the area. However, the area may lack hydric soil indicators. *NOTE: Subsection D is not intended to bring into CE jurisdiction those man-made wetlands that are exempted under CE regulations or policy.* It is also important to consider whether the man-induced changes are now the "normal circumstances" for the area. Both the relative permanence of the change and the functioning of the area as a wetland are implied.

72. When any of the three types of situations described in paragraph 71 occurs, application of methods described in Sections D and/or E will lead to the conclusion that the area is not a wetland because positive wetland indicators for at least one of the three parameters will be absent. Therefore, apply procedures described in one of the following subsections (as appropriate) to determine whether positive indicators of hydrophytic vegetation, hydric soils, and/or wetland hydrology existed prior to alteration of the area. Once these procedures have been employed, RETURN TO Section D or E to make a wetland determination. PROCEED TO the appropriate subsection.

Subsection 1 - Vegetation

73. Employ the following steps to determine whether hydrophytic vegetation previously occurred:

- STEP 1 - Describe the Type of Alteration. Examine the area and describe the type of alteration that occurred. Look for evidence of selective harvesting, clear cutting, bulldozing, recent conversion to agriculture, or other activities (e.g., burning, discing, or presence of buildings, dams, levees, roads, parking lots, etc.). Determine the approximate date* when the alteration occurred. Record observations on DATA FORM 3, and PROCEED TO STEP 2.
- STEP 2 - Describe Effects on Vegetation. Record on DATA FORM 3 a general description of how the activities (STEP 1) have affected the plant communities. Consider the following:
  - a. Has all or a portion of the area been cleared of vegetation?
  - b. Has only one layer of the plant community (e.g. trees) been removed?
  - c. Has selective harvesting resulted in removal of some species?
  - d. Has all vegetation been covered by fill, dredged material, or structures?
  - e. Have increased water levels resulted in the death of some individuals?

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* It is especially important to determine whether the alteration occurred prior to implementation of Section 404.

PROCEED TO STEP 3.

- STEP 3 - Determine the Type of Vegetation That Previously Occurred.

Obtain all possible evidence of the type of plant communities that occurred in the area prior to alteration. Potential sources of such evidence include:

a. Aerial photography. Recent (within 5 years) aerial photography can often be used to document the type of previous vegetation. The general type of plant communities formerly present can usually be determined, and species identification is sometimes possible.

b. Onsite inspection. Many types of activities result in only partial removal of the previous plant communities, and remaining species may be indicative of hydrophytic vegetation. In other cases, plant fragments (e.g. stumps, roots) may be used to reconstruct the plant community types that occurred prior to site alteration. Sometimes, this can be determined by examining piles of debris resulting from land-clearing operations or excavation to uncover identifiable remains of the previous plant community.

c. Previous site inspections. Documented evidence from previous inspections of the area may describe the previous plant communities, particularly in cases where the area was altered after a permit application was denied.

d. Adjacent vegetation. Circumstantial evidence of the type of plant communities that previously occurred may sometimes be obtained by examining the vegetation in adjacent areas. If adjacent areas have the same topographic position, soils, and hydrology as the altered area, the plant community types on the altered area were probably similar to those of the adjacent areas.

e. SCS records. Most SCS soil surveys include a description of the plant community types associated with each soil type. If the soil type on the altered area can be determined, it may be possible to generally determine the type of plant communities that previously occurred.

f. Permit applicant. In some cases, the permit applicant may provide important information about the type of plant communities that occurred prior to alteration.

g. Public. Individuals familiar with the area may provide a good general description of the previously occurring plant communities.

h. NWI wetland maps. The NWI has developed wetland type maps for many areas. These may be useful in determining the type of plant communities that occurred prior to alteration.

To develop the strongest possible record, all of the above sources should be considered. If the plant community types that occurred prior to alteration can be determined, record them on DATA FORM 3 and also record the basis used for the determination. PROCEED TO STEP 4. If it is impossible to determine the plant community types that occurred on the area prior to alteration, a determination cannot be made using all three parameters. In such cases, the determination must be based on the other two parameters. PROCEED TO Subsection 2 or 3 if one of the other parameters has been altered, or return to the appropriate Subsection of Section D or to Section E, as appropriate.

- <u>STEP 4 - Determine Whether Plant Community Types Constitute Hydrophytic Vegetation.</u> Develop a list of species that previously occurred on the site (DATA FORM 3). Subject the species list to applicable indicators of hydrophytic vegetation (PART III, paragraph 35). If none of the indicators are met, the plant communities that previously occurred did not constitute hydrophytic vegetation. If hydrophytic vegetation was present and no other parameter was in question, record appropriate data on the vegetation portion of DATA FORM 3, and return to either the appropriate subsection of Section D or to Section E. If either of the other parameters was also in question, PROCEED TO Subsection 2 or 3.

Subsection 2 - Soils

74. Employ the following steps to determine whether hydric soils previously occurred:

- <u>STEP 1 - Describe the Type of Alteration</u>. Examine the area and describe the type of alteration that occurred. Look for evidence of:
  - <u>a</u>. <u>Deposition of dredged or fill material or natural sedimentation.</u> In many cases the presence of fill material will be obvious. If so, it will be necessary to dig a hole to reach the original soil (sometimes several feet deep). Fill material will usually be a different color or texture than the original soil (except when fill material has been obtained from like areas onsite). Look for decomposing vegetation between soil layers and the presence of buried organic or hydric soil layers. In accreting or recently formed sandbars in riverine situations, the soils may support hydrophytic vegetation but lack hydric soil characteristics.
  - <u>b</u>. <u>Presence of nonwoody debris at the surface.</u> This can only be applied in areas where the original soils do not contain rocks.

Nonwoody debris includes items such as rocks, bricks, and concrete fragments.

c. Subsurface plowing. Has the area recently been plowed below the A-horizon or to depths of greater than 10 in.?

d. Removal of surface layers. Has the surface soil layer been removed by scraping or natural landslides? Look for bare soil surfaces with exposed plant roots or scrape scars on the surface.

e. Presence of man-made structures. Are buildings, dams, levees, roads, or parking lots present?

Determine the approximate date* when the alteration occurred. This may require checking aerial photography, examining building permits, etc. Record on DATA FORM 3, and PROCEED TO STEP 2.

- Step 2 - Describe Effects on Soils. Record on DATA FORM 3 a general description of how identified activities in STEP 1 have affected the soils. Consider the following:

a. Has the soil been buried? If so, record the depth of fill material and determine whether the original soil is intact.

b. Has the soil been mixed at a depth below the A-horizon or greater than 10 inches? If so, it will be necessary to examine the original soil at a depth immediately below the plowed zone. Record supporting evidence.

c. Has the soil been sufficiently altered to change the soil phase? Describe these changes.

PROCEED TO STEP 3.

- STEP 3 - Characterize Soils That Previously Occurred. Obtain all possible evidence that may be used to characterize soils that previously occurred on the area. Consider the following potential sources of information:

a. Soil surveys. In many cases, recent soil surveys will be available. If so, determine the soil series that were mapped for the area, and compare these soil series with the list of hydric soils (Appendix D, Section 2). If all soil series are listed as hydric soils, the entire area had hydric soils prior to alteration.

b. Characterization of buried soils. When fill material has been placed over the original soil without physically disturbing the soil, examine and characterize the buried soils. To accomplish this, dig a hole through the fill material until the original soil is encountered. Determine the point at which the original

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* It is especially important to determine whether the alteration occurred prior to implementation of Section 404.

soil material begins. Remove 12 inches of the original soil from the hole and look for indicators of hydric soils (PART III, paragraphs 44 and/or 45) immediately below the A-horizon or 10 inches (whichever is shallower). Record on DATA FORM 3 the color of the soil matrix, presence of an organic layer, presence of mottles or gleying, and/or presence of iron and manganese concretions. If the original soil is mottled and the chroma of the soil matrix is 2 or less,* a hydric soil was formerly present on the site. If any of these indicators are found, the original soil was a hydric soil. *(NOTE: When the fill material is a thick layer, it might be necessary to use a backhoe or posthole digger to excavate the soil pit.)* If USGS quadrangle maps indicate distinct variation in area topography, this procedure must be applied in each portion of the area that originally had a different surface elevation. Record findings on DATA FORM 3.

c. Characterization of plowed soils. Determine the depth to which the soil has been disturbed by plowing. Look for hydric soil characteristics (PART III, paragraphs 44 and/or 45) immediately below this depth. Record findings on DATA FORM 3.

d. Removal of surface layers. Dig a hole (Appendix D, Section 1) and determine whether the entire surface layer (A-horizon) has been removed. If so, examine the soil immediately below the top of the subsurface layer (B-horizon) for hydric soil characteristics. As an alternative, examine an undisturbed soil of the same soil series occurring in the same topographic position in an immediately adjacent area that has not been altered. Look for hydric soil indicators immediately below the A-horizon or 10 inches (whichever is shallower), and record findings on DATA FORM 3.

If sufficient data on soils that existed prior to alteration can be obtained to determine whether a hydric soil was present, PROCEED TO STEP 4. If not, a determination cannot be made using soils. Use the other parameters (Subsections 1 and 3) for the determination.

- STEP 4 - Determine Whether Hydric Soils Were Formerly Present.

Examine the available data and determine whether indicators of hydric soils (PART III, paragraphs 44 and/or 45) were formerly present. If no indicators of hydric soils were found, the original soils were not hydric soils. If indicators of hydric soils were found, record the appropriate indicators on DATA FORM 3 and PROCEED TO Subsection 3 if the hydrology of the area has been significantly altered or return either to the appropriate subsection of Section D or to Section E and characterize the area hydrology.

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* The matrix chroma must be 1 or less if no mottles are present (see paragraph 44). The soil must be moist when colors are determined.

Subsection 3 - Hydrology

75. Apply the following steps to determine whether wetland hydrology previously occurred:

- STEP 1 - Describe the Type of Alteration. Examine the area and describe the type of alteration that occurred. Look for evidence of:

  a. Dams. Has recent construction of a dam or some natural event (e.g. beaver activity or landslide) caused the area to become increasingly wetter or drier? *NOTE: This activity could have occurred a considerable distance away from the site in question.*

  b. Levees, dikes, and similar structures. Have levees or dikes recently been constructed that prevent the area from becoming periodically inundated by overbank flooding?

  c. Ditching. Have ditches been constructed recently that cause the area to drain more rapidly following inundation?

  d. Filling of channels or depressions (land-leveling). Have natural channels or depressions been recently filled?

  e. Diversion of water. Has an upstream drainage pattern been altered that results in water being diverted from the area?

  f. Ground-water extraction. Has prolonged and intensive pumping of ground water for irrigation or other purposes significantly lowered the water table and/or altered drainage patterns?

  g. Channelization. Have feeder streams recently been channelized sufficiently to alter the frequency and/or duration of inundation?

  Determine the approximate date* when the alteration occurred. Record observations on DATA FORM 3 and PROCEED TO STEP 2.

- STEP 2 - Describe Effects of Alteration on Area Hydrology. Record on DATA FORM 3 a general description of how the observed alteration (STEP 1) has affected the area. Consider the following:

  a. Is the area more frequently or less frequently inundated than prior to alteration? To what degree and why?

  b. Is the duration of inundation and soil saturation different than prior to alteration? How much different and why?

  PROCEED TO STEP 3.

- STEP 3 - Characterize the Hydrology That Previously Existed in the Area. Obtain all possible evidence that may be used to characterize

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* It is especially important to determine whether the alteration occurred prior to implementation of Section 404.

the hydrology that previously occurred. Potential sources of information include:

a. Stream or tidal gage data. If a stream or tidal gaging station is located near the area, it may be possible to calculate elevations representing the upper limit of wetlands hydrology based on duration of inundation. Consult hydrologists from the local CE District Office for assistance. The resulting mean sea level elevation will represent the upper limit of inundation for the area in the absence of any alteration. If fill material has not been placed on the area, survey this elevation from the nearest USGS benchmark. Record elevations representing zone boundaries on DATA FORM 3. If fill material has been placed on the area, compare the calculated elevation with elevations shown on a USGS quadrangle or any other survey map that predated site alteration.

b. Field hydrologic indicators. Certain field indicators of wetland hydrology (PART III, paragraph 49) may still be present. Look for watermarks on trees or other structures, drift lines, and debris deposits. Record these on DATA FORM 3. If adjacent undisturbed areas are in the same topographic position and are similarly influenced by the same sources of inundation, look for wetland indicators in these areas.

c. Aerial photography. Examine any available aerial photography and determine whether the area was inundated at the time of the photographic mission. Consider the time of the year that the aerial photography was taken and use only photography taken during the growing season and prior to site alteration.

d. Historical records. Examine any available historical records for evidence that the area has been periodically inundated. Obtain copies of any such information and record findings on DATA FORM 3.

e. Floodplain Management Maps. Determine the previous frequency of inundation of the area from Floodplain Management Maps (if available). Record flood frequency on DATA FORM 3.

f. Public or local government officials. Contact individuals who might have knowledge that the area was periodically inundated.

If sufficient data on hydrology that existed prior to site alteration can be obtained to determine whether wetland hydrology was previously present, PROCEED TO STEP 4. If not, a determination involving hydrology cannot be made. Use other parameters (Subsections 1 and 2) for the wetland determination. Return to either the appropriate subsection of Section D or to Section E and complete the necessary data forms. PROCEED TO STEP 4 if the previous hydrology can be characterized.

- STEP 4 - Determine Whether Wetland Hydrology Previously Occurred.

Examine the available data and determine whether indicators of wetland hydrology (PART III, paragraph 49) were present prior to site alteration. If no indicators of wetland hydrology were found, the original hydrology of the area was not wetland hydrology. If indicators of wetland hydrology were found, record the appropriate indicators on DATA FORM 3 and return either to the appropriate subsection of Section D or to Section E and complete the wetland determination.

Subsection 4 - Man-Induced Wetlands

76. A man-induced wetland is an area that has developed at least some characteristics of naturally occurring wetlands due to either intentional or incidental human activities. Examples of man-induced wetlands include irrigated wetlands, wetlands resulting from impoundment (e.g. reservoir shorelines), wetlands resulting from filling of formerly deepwater habitats, dredged material disposal areas, and wetlands resulting from stream channel realignment. Some man-induced wetlands may be subject to Section 404. In virtually all cases, man-induced wetlands involve a significant change in the hydrologic regime, which may either increase or decrease the wetness of the area. Although wetland indicators of all three parameters (i.e. vegetation, soils, and hydrology) may be found in some man-induced wetlands, indicators of hydric soils are usually absent. Hydric soils require long periods (hundreds of years) for development of wetness characteristics, and most man-induced wetlands have not been in existence for a sufficient period to allow development of hydric soil characteristics. Therefore, application of the multiparameter approach in making wetland determinations in man-induced wetlands must be based on the presence of hydrophytic vegetation and wetland hydrology.* There must also be documented evidence that the wetland resulted from human activities. Employ the following steps to determine whether an area consists of wetlands resulting from human activities:

- STEP 1 - Determine Whether the Area Represents a Potential Man-Induced Wetland. Consider the following questions:

  a. Has a recent man-induced change in hydrology occurred that caused the area to become significantly wetter?

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* Uplands that support hydrophytic vegetation due to agricultural irrigation and that have an obvious hydrologic connection to other "waters of the United States" should not be delineated as wetlands under this subsection.

b. Has a major man-induced change in hydrology that occurred in the past caused a former deepwater aquatic habitat to become significantly drier?

c. Has man-induced stream channel realignment significantly altered the area hydrology?

d. Has the area been subjected to long-term irrigation practices?

If the answer to any of the above questions is YES, document the approximate time during which the change in hydrology occurred, and PROCEED TO STEP 2. If the answer to all of the questions is NO, procedures described in Section D or E must be used.

- STEP 2 - Determine Whether a Permit Will be Needed if the Area is Found to be a Wetland. Consider the current CE regulations and policy regarding man-induced wetlands. If the type of activity resulting in the area being a potential man-induced wetland is exempted by regulation or policy, no further action is needed. If not exempt, PROCEED TO STEP 3.

- STEP 3 - Characterize the Area Vegetation, Soils, and Hydrology. Apply procedures described in Section D (routine determinations) or Section E (comprehensive determinations) to the area. Complete the appropriate data forms and PROCEED TO STEP 4.

- STEP 4 - Wetland Determination. Based on information resulting from STEP 3, determine whether the area is a wetland. When wetland indicators of all three parameters are found, the area is a wetland. When indicators of hydrophytic vegetation and wetland hydrology are found and there is documented evidence that the change in hydrology occurred so recently that soils could not have developed hydric characteristics, the area is a wetland. In such cases, it is assumed that the soils are functioning as hydric soils. *CAUTION: If hydrophytic vegetation is being maintained only because of man-induced wetland hydrology that would no longer exist if the activity (e.g. irrigation) were to be terminated, the area should not be considered a wetland.*

Section G - Problem Areas

77. There are certain wetland types and/or conditions that may make application of indicators of one or more parameters difficult, at least at certain times of the year. These are not considered to be atypical situations. Instead, they are wetland types in which wetland indicators of one or more parameters may be periodically lacking due to normal seasonal or annual variations in environmental conditions that result from causes other than human activities or catastrophic natural events.

Types of problem areas

78. Representative examples of potential problem areas, types of variations that occur, and their effects on wetland indicators are presented in the following subparagraphs. Similar situations may sometimes occur in other wetland types. *Note: This section is not intended to bring nonwetland areas having wetland indicators of two, but not all three, parameters into Section 404 jurisdiction.*

- a. Wetlands on drumlins. Slope wetlands occur in glaciated areas in which thin soils cover relatively impermeable glacial till or in which layers of glacial till have different hydraulic conditions that produce a broad zone of ground-water seepage. Such areas are seldom, if ever, flooded, but downslope ground-water movement keeps the soils saturated for a sufficient portion of the growing season to produce anaerobic and reducing soil conditions. This fosters development of hydric soil characteristics and selects for hydrophytic vegetation. Indicators of wetland hydrology may be lacking during the drier portion of the growing season.

- b. Seasonal wetlands. In many regions (especially in western states), depression areas occur that have wetland indicators of all three parameters during the wetter portion of the growing season, but normally lack wetland indicators of hydrology and/or vegetation during the drier portion of the growing season. Obligate hydrophytes and facultative wetland plant species (Appendix C, Section 1 or 2) normally are dominant during the wetter portion of the growing season, while upland species (annuals) may be dominant during the drier portion of the growing season. These areas may be inundated during the wetter portion of the growing season, but wetland hydrology indicators may be totally lacking during the drier portion of the growing season. It is important to establish that an area truly is a water body. Water in a depression normally must be sufficiently persistent to exhibit an ordinary high-water mark or the presence of wetland characteristics before it can be considered as a water body potentially subject to Clean Water Act jurisdiction. The determination that an area exhibits wetland characteristics for a sufficient portion of the growing season to qualify as a wetland under the Clean Water Act must be made on a case-by-case basis. Such determinations should consider the respective length of time that the area exhibits upland and wetland characteristics, and the manner in which the area fits into the overall ecological system as a wetland. Evidence concerning the persistence of an area's wetness can be obtained from its history, vegetation, soil, drainage characteristics, uses to which it has been subjected, and weather or hydrologic records.

c. Prairie potholes. Prairie potholes normally occur as shallow depressions in glaciated portions of the north-central United States. Many are landlocked, while others have a drainage outlet to streams or other potholes. Most have standing water for much of the growing season in years of normal or above normal precipitation, but are neither inundated nor have saturated soils during most of the growing season in years of below normal precipitation. During dry years, potholes often become incorporated into farming plans, and are either planted to row crops (e.g. soybeans) or are mowed as part of a haying operation. When this occurs, wetland indicators of one or more parameters may be lacking. For example, tillage would eliminate any onsite hydrologic indicator, and would make detection of soil and vegetation indicators much more difficult.

d. Vegetated flats. In both coastal and interior areas throughout the Nation, vegetated flats are often dominated by annual species that are categorized as OBL. Application of procedures described in Sections D and E during the growing season will clearly result in a positive wetland determination. However, these areas will appear to be unvegetated mudflats when examined during the nongrowing season, and the area would not qualify at that time as a wetland due to an apparent lack of vegetation.

Wetland determinations in problem areas

79. Procedures for making wetland determinations in problem areas are presented below. Application of these procedures is appropriate only when a decision has been made in Section D or E that wetland indicators of one or more parameters were lacking, probably due to normal seasonal or annual variations in environmental conditions. Specific procedures to be used will vary according to the nature of the area, site conditions, and parameter(s) affected by the variations in environmental conditions. A determination must be based on the best evidence available to the field inspector, including:

a. Available information (Section B).

b. Field data resulting from an onsite inspection.

c. Basic knowledge of the ecology of the particular community type(s) and environmental conditions associated with the community type.

NOTE: The procedures described below should only be applied to parameters not adequately characterized in Section D or E. Complete the following steps:

- STEP 1 - Identify the Parameter(s) to be Considered. Examine the DATA FORM 1 (Section D or E) and identify the parameter(s) that must be given additional consideration. PROCEED TO STEP 2.

- STEP 2 - Determine the Reason for Further Consideration. Determine the reason why the parameter(s) identified in STEP 1 should be given further consideration. This will require a consideration and documentation of:

  a. Environmental condition(s) that have impacted the parameter(s).

  b. Impacts of the identified environmental condition(s) on the parameter(s) in question.

Record findings in the comments section of DATA FORM 1. PROCEED TO STEP 3.

- STEP 3 - Document Available Information for Parameter(s) in Question. Examine the available information and consider personal ecological knowledge of the range of normal environmental conditions of the area. Local experts (e.g. university personnel) may provide additional information. Record information on DATA FORM 1. PROCEED TO STEP 4.

- STEP 4 - Determine Whether Wetland Indicators are Normally Present During a Portion of the Growing Season. Examine the information resulting from STEP 3 and determine whether wetland indicators are normally present during part of the growing season. If so, record on DATA FORM 1 the indicators normally present and return to Section D or Section E and make a wetland determination. If no information can be found that wetland indicators of all three parameters are normally present during part of the growing season, the determination must be made using procedures described in Section D or Section E.

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APPENDIX A: GLOSSARY

Active water table - A condition in which the zone of soil saturation fluctuates, resulting in periodic anaerobic soil conditions. Soils with an active water table often contain bright mottles and matrix chromas of 2 or less.

Adaptation - A modification of a species that makes it more fit for existence under the conditions of its environment. These modifications are the result of genetic selection processes.

Adventitious roots - Roots found on plant stems in positions where they normally do not occur.

Aerenchymous tissue - A type of plant tissue in which cells are unusually large and arranged in a manner that results in air spaces in the plant organ. Such tissues are often referred to as spongy and usually provide increased buoyancy.

Aerobic - A situation in which molecular oxygen is a part of the environment.

Anaerobic - A situation in which molecular oxygen is absent (or effectively so) from the environment.

Aquatic roots - Roots that develop on stems above the normal position occupied by roots in response to prolonged inundation.

Aquic moisture regime - A mostly reducing soil moisture regime nearly free of dissolved oxygen due to saturation by ground water or its capillary fringe and occurring at periods when the soil temperature at 19.7 in. is greater than 5° C.

Arched roots - Roots produced on plant stems in a position above the normal position of roots, which serve to brace the plant during and following periods of prolonged inundation.

Areal cover - A measure of dominance that defines the degree to which aboveground portions of plants (not limited to those rooted in a sample plot) cover the ground surface. It is possible for the total areal cover in a community to exceed 100 percent because (a) most plant communities consist of two or more vegetative strata; (b) areal cover is estimated by vegetative layer; and (c) foliage within a single layer may overlap.

Atypical situation - As used herein, this term refers to areas in which one or more parameters (vegetation, soil, and/or hydrology) have been sufficiently altered by recent human activities or natural events to preclude the presence of wetland indicators of the parameter.

Backwater flooding - Situations in which the source of inundation is overbank flooding from a nearby stream.

Basal area - The cross-sectional area of a tree trunk measured in square inches, square centimetres, etc. Basal area is normally measured at 4.5 ft above the ground level and is used as a measure of dominance. The most easily used tool for measuring basal area is a tape marked in square inches. When plotless methods are used, an angle gauge or prism will provide a means for rapidly determining basal area. This term is also applicable to the cross-sectional area of a clumped herbaceous plant, measured at 1.0 in. above the soil surface.

Bench mark - A fixed, more or less permanent reference point or object, the elevation of which is known. The US Geological Survey (USGS) installs brass caps in bridge abutments or otherwise permanently sets bench marks at convenient locations nationwide. The elevations on these marks are referenced to the National Geodetic Vertical Datum (NGVD), also commonly known as mean sea level (MSL). Locations of these bench marks on USGS quadrangle maps are shown as small triangles. However, the marks are sometimes destroyed by construction or vandalism. The existence of any bench mark should be field verified before planning work that relies on a particular reference point. The USGS and/or local state surveyor's office can provide information on the existence, exact location, and exact elevation of bench marks.

Biennial - An event that occurs at 2-year intervals.

Buried soil - A once-exposed soil now covered by an alluvial, loessal, or other deposit (including man-made).

Canopy layer - The uppermost layer of vegetation in a plant community. In forested areas, mature trees comprise the canopy layer, while the tallest herbaceous species constitute the canopy layer in a marsh.

Capillary fringe - A zone immediately above the water table (zero gauge pressure) in which water is drawn upward from the water table by capillary action.

Chemical reduction - Any process by which one compound or ion acts as an electron donor. In such cases, the valence state of the electron donor is decreased.

Chroma - The relative purity or saturation of a color; intensity of distinctive hue as related to grayness; one of the three variables of color.

Comprehensive wetland determination - A type of wetland determination that is based on the strongest possible evidence, requiring the collection of quantitative data.

Concretion - A local concentration of chemical compounds (e.g. calcium carbonate, iron oxide) in the form of a grain or nodule of varying size, shape, hardness, and color. Concretions of significance in hydric soils are usually iron and/or manganese oxides occurring at or near the soil surface, which develop under conditions of prolonged soil saturation.

Contour - An imaginary line of constant elevation on the ground surface. The corresponding line on a map is called a "contour line."

Criteria - Standards, rules, or tests on which a judgment or decision may be based.

Deepwater aquatic habitat - Any open water area that has a mean annual water depth >6.6 ft, lacks soil, and/or is either unvegetated or supports only floating or submersed macrophytes.

Density - The number of individuals of a species per unit area.

Detritus - Minute fragments of plant parts found on the soil surface. When fused together by algae or soil particles, this is an indicator that surface water was recently present.

Diameter at breast height (DBH) - The width of a plant stem as measured at 4.5 ft above the ground surface.

Dike - A bank (usually earthen) constructed to control or confine water.

Dominance - As used herein, a descriptor of vegetation that is related to the standing crop of a species in an area, usually measured by height, areal cover, or basal area (for trees).

Dominant species - As used herein, a plant species that exerts a controlling influence on or defines the character of a community.

Drained - A condition in which ground or surface water has been reduced or eliminated from an area by artificial means.

Drift line - An accumulation of debris along a contour (parallel to the water flow) that represents the height of an inundation event.

Duration (inundation/soil saturation) - The length of time during which water stands at or above the soil surface (inundation), or during which the soil is saturated. As used herein, duration refers to a period during the growing season.

Ecological tolerance - The range of environmental conditions in which a plant species can grow.

Emergent plant - A rooted herbaceous plant species that has parts extending above a water surface.

Field capacity - The percentage of water remaining in a soil after it has been saturated and after free drainage is negligible.

Fill material - Any material placed in an area to increase surface elevation.

Flooded - A condition in which the soil surface is temporarily covered with flowing water from any source, such as streams overflowing their banks, runoff from adjacent or surrounding slopes, inflow from high tides, or any combination of sources.

Flora - A list of all plant species that occur in an area.

Frequency (inundation or soil saturation) - The periodicity of coverage of an area by surface water or soil saturation. It is usually expressed as the number of years (e.g. 50 years) the soil is inundated or saturated at least once each year during part of the growing season per 100 years or as a 1-, 2-, 5-year, etc., inundation frequency.

Frequency (vegetation) - The distribution of individuals of a species in an area. It is quantitatively expressed as

$$\frac{\text{Number of samples containing species A}}{\text{Total number of samples}} \times 100$$

More than one species may have a frequency of 100 percent within the same area.

Frequently flooded - A flooding class in which flooding is likely to occur often under normal weather conditions (more than 50-percent chance of flooding in any year or more than 50 times in 100 years).

Gleyed - A soil condition resulting from prolonged soil saturation, which is manifested by the presence of bluish or greenish colors through the soil mass or in mottles (spots or streaks) among other colors. Gleying occurs under reducing soil conditions resulting from soil saturation, by which iron is reduced predominantly to the ferrous state.

Ground water - That portion of the water below the ground surface that is under greater pressure than atmospheric pressure.

Growing season - The portion of the year when soil temperatures at 19.7 inches below the soil surface are higher than biologic zero (5° C) (US Department of Agriculture - Soil Conservation Service 1985).* For ease of determination this period can be approximated by the number of frost-free days (US Department of the Interior 1970).

Habitat - The environment occupied by individuals of a particular species, population, or community.

Headwater flooding - A situation in which an area becomes inundated directly by surface runoff from upland areas.

Herb - A nonwoody individual of a macrophytic species. In this manual, seedlings of woody plants (including vines) that are less than 3.2 ft in height are considered to be herbs.

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* See references at the end of the main text.

Herbaceous layer - Any vegetative stratum of a plant community that is composed predominantly of herbs.

Histic epipedon - An 8- to 16-in. soil layer at or near the surface that is saturated for 30 consecutive days or more during the growing season in most years and contains a minimum of 20 percent organic matter when no clay is present or a minimum of 30 percent organic matter when 60 percent or greater clay is present.

Histosols - An order in soil taxonomy composed of organic soils that have organic soil materials in more than half of the upper 80 cm or that are of any thickness if directly overlying bedrock.

Homogeneous vegetation - A situation in which the same plant species association occurs throughout an area.

Hue - A characteristic of color that denotes a color in relation to red, yellow, blue, etc; one of the three variables of color. Each color chart in the Munsell Color Book (Munsell Color 1975) consists of a specific hue.

Hydric soil - A soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation (US Department of Agriculture-Soil Conservation Service 1985). Hydric soils that occur in areas having positive indicators of hydrophytic vegetation and wetland hydrology are wetland soils.

Hydric soil condition - A situation in which characteristics exist that are associated with soil development under reducing conditions.

Hydrologic regime - The sum total of water that occurs in an area on average during a given period.

Hydrologic zone - An area that is inundated or has saturated soils within a specified range of frequency and duration of inundation and soil saturation.

Hydrology - The science dealing with the properties, distribution, and circulation of water.

Hydrophyte - Any macrophyte that grows in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content; plants typically found in wet habitats.

Hydrophytic vegetation - The sum total of macrophytic plant life growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content. When hydrophytic vegetation comprises a community where indicators of hydric soils and wetland hydrology also occur, the area has wetland vegetation.

Hypertrophied lenticels - An exaggerated (oversized) pore on the surface of stems of woody plants through which gases are exchanged between the plant and the atmosphere. The enlarged lenticels serve as a mechanism for increasing oxygen to plant roots during periods of inundation and/or saturated soils.

Importance value - A quantitative term describing the relative influence of a plant species in a plant community, obtained by summing any combination of relative frequency, relative density, and relative dominance.

Indicator - As used in this manual, an event, entity, or condition that typically characterizes a prescribed environment or situation; indicators determine or aid in determining whether or not certain stated circumstances exist.

Indicator status - One of the categories (e.g. OBL) that describes the estimated probability of a plant species occurring in wetlands.

Intercellular air space - A cavity between cells in plant tissues, resulting from variations in cell shape and configuration. Aerenchymous tissue (a morphological adaptation found in many hydrophytes) often has large intercellular air spaces.

Inundation - A condition in which water from any source temporarily or permanently covers a land surface.

Levee - A natural or man-made feature of the landscape that restricts movement of water into or through an area.

Liana - As used in this manual, a layer of vegetation in forested plant communities that consists of woody vines. The term may also be applied to a given species.

Limit of biological activity - With reference to soils, the zone below which conditions preclude normal growth of soil organisms. This term often is used to refer to the temperature (5° C) in a soil below which metabolic processes of soil microorganisms, plant roots, and animals are negligible.

Long duration (flooding) - A flooding class in which the period of inundation for a single event ranges from 7 days to 1 month.

Macrophyte - Any plant species that can be readily observed without the aid of optical magnification. This includes all vascular plant species and mosses (e.g., *Sphagnum* spp.), as well as large algae (e.g. *Chara* spp., kelp).

Macrophytic - A term referring to a plant species that is a macrophyte.

Major portion of the root zone. The portion of the soil profile in which more than 50 percent of plant roots occur. In wetlands, this usually constitutes the upper 12 in. of the profile.

Man-induced wetland - Any area that develops wetland characteristics due to some activity (e.g., irrigation) of man.

Mapping unit - As used in this manual, some common characteristic of soil, vegetation, and/or hydrology that can be shown at the scale of mapping for the defined purpose and objectives of a survey.

Mean sea level - A datum, or "plane of zero elevation," established by averaging all stages of oceanic tides over a 19-year tidal cycle or "epoch." This plane is corrected for curvature of the earth and is the standard reference for elevations on the earth's surface. The correct term for mean sea level is the National Geodetic Vertical Datum (NGVD).

Mesophytic - Any plant species growing where soil moisture and aeration conditions lie between extremes. These species are typically found in habitats with average moisture conditions, neither very dry nor very wet.

Metabolic processes - The complex of internal chemical reactions associated with life-sustaining functions of an organism.

Method - A particular procedure or set of procedures to be followed.

Mineral soil - A soil consisting predominantly of, and having its properties determined predominantly by, mineral matter usually containing less than 20-percent organic matter.

Morphological adaptation - A feature of structure and form that aids in fitting a species to its particular environment (e.g. buttressed base, adventitious roots, aerenchymous tissue).

Mottles - Spots or blotches of different color or shades of color interspersed within the dominant color in a soil layer, usually resulting from the presence of periodic reducing soil conditions.

Muck - Highly decomposed organic material in which the original plant parts are not recognizable.

Multitrunk - A situation in which a single individual of a woody plant species has several stems.

Nonhydric soil - A soil that has developed under predominantly aerobic soil conditions. These soils normally support mesophytic or xerophytic species.

Nonwetland - Any area that has sufficiently dry conditions that indicators of hydrophytic vegetation, hydric soils, and/or wetland hydrology are lacking. As used in this manual, any area that is neither a wetland, a deepwater aquatic habitat, nor other special aquatic site.

Organic pan - A layer usually occurring at 12 to 30 inches below the soil surface in coarse-textured soils, in which organic matter and aluminum (with or without iron) accumulate at the point where the top of the water table most often occurs. Cementing of the organic matter slightly reduces permeability of this layer.

Organic soil - A soil is classified as an organic soil when it is: (1) saturated for prolonged periods (unless artificially drained) and has more than 30-percent organic matter if the mineral fraction is more than 50-percent clay, or more than 20-percent organic matter if the mineral fraction has no clay; or (2) never saturated with water for more than a few days and having more than 34-percent organic matter.

Overbank flooding - Any situation in which inundation occurs as a result of the water level of a stream rising above bank level.

Oxidation-reduction process - A complex of biochemical reactions in soil that influences the valence state of component elements and their ions. Prolonged soil saturation during the growing season elicits anaerobic conditions that shift the overall process to a reducing condition.

Oxygen pathway - The sequence of cells, intercellular spaces, tissues, and organs, through which molecular oxygen is transported in plants. Plant species having pathways for oxygen transport to the root system are often adapted for life in saturated soils.

Parameter - A characteristic component of a unit that can be defined. Vegetation, soil, and hydrology are three parameters that may be used to define wetlands.

Parent material - The unconsolidated and more or less weathered mineral or organic matter from which a soil profile develops.

Ped - A unit of soil structure (e.g. aggregate, crumb, prism, block, or granule) formed by natural processes.

Peraquic moisture regime - A soil condition in which a reducing environment always occurs due to the presence of ground water at or near the soil surface.

Periodically - Used herein to define detectable regular or irregular saturated soil conditions or inundation, resulting from ponding of ground water, precipitation, overland flow, stream flooding, or tidal influences that occur(s) with hours, days, weeks, months, or even years between events.

Permeability - A soil characteristic that enables water or air to move through the profile, measured as the number of inches per hour that water moves downward through the saturated soil. The rate at which water moves through the least permeable layer governs soil permeability.

Physiognomy - A term used to describe a plant community based on the growth habit (e.g., trees, herbs, lianas) of the dominant species.

Physiological adaptation - A feature of the basic physical and chemical activities that occurs in cells and tissues of a species, which results in it being better fitted to its environment (e.g. ability to absorb nutrients under low oxygen tensions).

Plant community - All of the plant populations occurring in a shared habitat or environment.

Plant cover - See areal cover.

Pneumatophore - Modified roots that may function as a respiratory organ in species subjected to frequent inundation or soil saturation (e.g., cypress knees).

Ponded - A condition in which water stands in a closed depression. Water may be removed only by percolation, evaporation, and/or transpiration.

Poorly drained - Soils that commonly are wet at or near the surface during a sufficient part of the year that field crops cannot be grown under natural conditions. Poorly drained conditions are caused by a saturated zone, a layer with low hydraulic conductivity, seepage, or a combination of these conditions.

Population - A group of individuals of the same species that occurs in a given area.

Positive wetland indicator - Any evidence of the presence of hydrophytic vegetation, hydric soil, and/or wetland hydrology in an area.

Prevalent vegetation - The plant community or communities that occur in an area during a given period. The prevalent vegetation is characterized by the dominant macrophytic species that comprise the plant community.

Quantitative - A precise measurement or determination expressed numerically.

Range - As used herein, the geographical area in which a plant species is known to occur.

Redox potential - A measure of the tendency of a system to donate or accept electrons, which is governed by the nature and proportions of the oxidizing and reducing substances contained in the system.

Reducing environment - An environment conducive to the removal of oxygen and chemical reduction of ions in the soils.

Relative density - A quantitative descriptor, expressed as a percent, of the relative number of individuals of a species in an area; it is calculated by

$$\frac{\text{Number of individuals of species A}}{\text{Total number of individuals of all species}} \times 100$$

Relative dominance - A quantitative descriptor, expressed as a percent, of the relative size or cover of individuals of a species in an area; it is calculated by

$$\frac{\text{Amount* of species A}}{\text{Total amount of all species}} \times 100$$

Relative frequency - A quantitative descriptor, expressed as a percent, of the relative distribution of individuals of a species in an area; it is calculated by

$$\frac{\text{Frequency of species A}}{\text{Total frequency of all species}} \times 100$$

---

* The "amount" of a species may be based on percent areal cover, basal area, or height.

Relief - The change in elevation of a land surface between two points; collectively, the configuration of the earth's surface, including such features as hills and valleys.

Reproductive adaptation - A feature of the reproductive mechanism of a species that results in it being better fitted to its environment (e.g. ability for seed germination under water).

Respiration - The sum total of metabolic processes associated with conversion of stored (chemical) energy into kinetic (physical) energy for use by an organism.

Rhizosphere - The zone of soil in which interactions between living plant roots and microorganisms occur.

Root zone - The portion of a soil profile in which plant roots occur.

Routine wetland determination - A type of wetland determination in which office data and/or relatively simple, rapidly applied onsite methods are employed to determine whether or not an area is a wetland. Most wetland determinations are of this type, which usually does not require collection of quantitative data.

Sample plot - An area of land used for measuring or observing existing conditions.

Sapling/shrub - A layer of vegetation composed of woody plants <3.0 in. in diameter at breast height but greater than 3.2 ft in height, exclusive of woody vines.

Saturated soil conditions - A condition in which all easily drained voids (pores) between soil particles in the root zone are temporarily or permanently filled with water to the soil surface at pressures greater than atmospheric.

Soil - Unconsolidated mineral and organic material that supports, or is capable of supporting, plants, and which has recognizable properties due to the integrated effect of climate and living matter acting upon parent material, as conditioned by relief over time.

Soil horizon - A layer of soil or soil material approximately parallel to the land surface and differing from adjacent genetically related layers in physical, chemical, and biological properties or characteristics (e.g. color, structure, texture, etc.).

Soil matrix - The portion of a given soil having the dominant color. In most cases, the matrix will be the portion of the soil having more than 50 percent of the same color.

Soil permeability - The ease with which gases, liquids, or plant roots penetrate or pass through a layer of soil.

Soil phase - A subdivision of a soil series having features (e.g. slope, surface texture, and stoniness) that affect the use and management of the soil, but which do not vary sufficiently to differentiate it as a separate series. These are usually the basic mapping units on detailed soil maps produced by the Soil Conservation Service.

Soil pore - An area within soil occupied by either air or water, resulting from the arrangement of individual soil particles or peds.

Soil profile - A vertical section of a soil through all its horizons and extending into the parent material.

Soil series - A group of soils having horizons similar in differentiating characteristics and arrangement in the soil profile, except for texture of the surface horizon.

Soil structure - The combination or arrangement of primary soil particles into secondary particles, units, or peds.

Soil surface - The upper limits of the soil profile. For mineral soils, this is the upper limit of the highest (A1) mineral horizon. For organic soils, it is the upper limit of undecomposed, dead organic matter.

Soil texture - The relative proportions of the various sizes of particles in a soil.

Somewhat poorly drained - Soils that are wet near enough to the surface or long enough that planting or harvesting operations or crop growth is markedly restricted unless artificial drainage is provided. Somewhat poorly drained soils commonly have a layer with low hydraulic conductivity, wet conditions high in the profile, additions of water through seepage, or a combination of these conditions.

Stilted roots - Aerial roots arising from stems (e.g., trunk and branches), presumably providing plant support (e.g., *Rhizophora mangle*).

Stooling - A form of asexual reproduction in which new shoots are produced at the base of senescing stems, often resulting in a multitrunk growth habit.

Stratigraphy - Features of geology dealing with the origin, composition, distribution, and succession of geologic strata (layers).

Substrate - The base or substance on which an attached species is growing.

Surface water - Water present above the substrate or soil surface.

Tidal - A situation in which the water level periodically fluctuates due to the action of lunar and solar forces upon the rotating earth.

Topography - The configuration of a surface, including its relief and the position of its natural and man-made features.

Transect - As used herein, a line on the ground along which observations are made at some interval.

Transition zone - The area in which a change from wetlands to nonwetlands occurs. The transition zone may be narrow or broad.

Transpiration - The process in plants by which water vapor is released into the gaseous environment, primarily through stomata.

Tree - A woody plant >3.0 in. in diameter at breast height, regardless of height (exclusive of woody vines).

Typical - That which normally, usually, or commonly occurs.

Typically adapted - A term that refers to a species being normally or commonly suited to a given set of environmental conditions, due to some feature of its morphology, physiology, or reproduction.

Unconsolidated parent material - Material from which a soil develops, usually formed by weathering of rock or placement in an area by natural forces (e.g. water, wind, or gravity).

Under normal circumstances - As used in the definition of wetlands, this term refers to situations in which the vegetation has not been substantially altered by man's activities.

Uniform vegetation - As used herein, a situation in which the same group of dominant species generally occurs throughout a given area.

Upland - As used herein, any area that does not qualify as a wetland because the associated hydrologic regime is not sufficiently wet to elicit development of vegetation, soils, and/or hydrologic characteristics associated with wetlands. Such areas occurring within floodplains are more appropriately termed nonwetlands.

Value (soil color) - The relative lightness or intensity of color, approximately a function of the square root of the total amount of light reflected from a surface; one of the three variables of color.

Vegetation - The sum total of macrophytes that occupy a given area.

Vegetation layer - A subunit of a plant community in which all component species exhibit the same growth form (e.g., trees, saplings/shrubs, herbs).

Very long duration (flooding) - A duration class in which the length of a single inundation event is greater than 1 month.

Very poorly drained - Soils that are wet to the surface most of the time. These soils are wet enough to prevent the growth of important crops (except rice) unless artificially drained.

Watermark - A line on a tree or other upright structure that represents the maximum static water level reached during an inundation event.

Water table - The upper surface of ground water or that level below which the soil is saturated with water. It is at least 6 in. thick and persists in the soil for more than a few weeks.

Wetlands - Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Wetland boundary - The point on the ground at which a shift from wetlands to nonwetlands or aquatic habitats occurs. These boundaries usually follow contours.

Wetland determination - The process or procedure by which an area is adjudged a wetland or nonwetland.

Wetland hydrology - The sum total of wetness characteristics in areas that are inundated or have saturated soils for a sufficient duration to support hydrophytic vegetation.

Wetland plant association - Any grouping of plant species that recurs wherever certain wetland conditions occur.

Wetland soil - A soil that has characteristics developed in a reducing atmosphere, which exists when periods of prolonged soil saturation result in anaerobic conditions. Hydric soils that are sufficiently wet to support hydrophytic vegetation are wetland soils.

Wetland vegetation - The sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present. As used herein, hydrophytic vegetation occurring in areas that also have hydric soils and wetland hydrology may be properly referred to as wetland vegetation.

Woody vine - See liana.

Xerophytic - A plant species that is typically adapted for life in conditions where a lack of water is a limiting factor for growth and/or reproduction. These species are capable of growth in extremely dry conditions as a result of morphological, physiological, and/or reproductive adaptations.

APPENDIX B: BLANK AND EXAMPLE DATA FORMS

DATA FORM 1

WETLAND DETERMINATION

Applicant Name:____________________ Application Number:______________ Project Name:______________

State:_________County:__________Legal Description: Township:_____Range:_____

Date:_______________ Plot No.:________________ Section:_________________

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		Herbs	
1.		7.	
2.		8.	
3.		9.	
Saplings/shrubs		Woody vines	
4.		10.	
5.		11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC:____. Other indicators:_________.

Hydrophytic vegetation: Yes ____ No ____. Basis:__________________________.

Soil

Series and phase:__________________ On hydric soils list? Yes_____; No____.

Mottled: Yes_____; No_____. Mottle color:_________; Matrix color:_________.

Gleyed: Yes_____ No_____ Other indicators:_______________________________.

Hydric soils: Yes_____ No_____; Basis:_________________________________.

Hydrology

Inundated: Yes_____; No_____. Depth of standing water:____________________.

Saturated soils: Yes_____; No_____. Depth to saturated soil:_______________.

Other indicators:____.

Wetland hydrology: Yes_____; No_____. Basis:____________________________.

Atypical situation: Yes____; No_____.

Normal Circumstances? Yes_____ No_____.

Wetland Determination: Wetland__________________; Nonwetland_______________.

Comments:

Determined by:________________________

DATA FORM 2

VEGETATION-COMPREHENSIVE DETERMINATION

Applicant Name:__________ Application No.:__________ Project Name:__________

Location:__________ Plot #:__________ Date:__________ Determined By:__________

VEGETATION LAYER

TREES	BASAL AREA	TOTAL BASAL AREA	RANK	HERBS	MIDPOINT OF % COVER CLASS	RANK
1				1		
2				2		
3				3		
4				4		
5				5		
6				6		
7				7		
8				8		
9				9		
10				10		

SAPLINGS/SHRUBS	MIDPOINT OF HEIGHT CLASS	TOTAL HEIGHT CLASS	RANK	WOODY VINES	NUMBER OF STEMS	RANK
1				1		
2				2		
3				3		
4				4		
5				5		
6				6		
7				7		
8				8		
9				9		
10				10		

DATA FORM 3

ATYPICAL SITUATIONS

Applicant Name:______________ Application Number:______________ Project Name:______________

Location:______________ Plot Number:______________ Date:______________

A. VEGETATION:

1. Type of Alteration:______________________________
____
______________________________.

2. Effect on Vegetation:______________________________
____
______________________________.

3. Previous Vegetation:______________________________
(Attach documentation) ______________________________
______________________________.

4. Hydrophytic Vegetation? Yes______________No______________.

B. SOILS:

1. Type of Alteration:______________________________
____
______________________________.

2. Effect on Soils:______________________________
____
______________________________.

3. Previous Soils:______________________________
(Attach documentation) ______________________________
______________________________.

4. Hydric Soils? Yes______________No______________.

C. HYDROLOGY:

1. Type of Alteration:______________________________
____
______________________________.

2. Effect on Hydrology:______________________________
____
______________________________.

3. Previous Hydrology:______________________________
(Attach documentation) ______________________________
______________________________.

4. Wetland Hydrology? Yes______________No______________.

Characterized By:______________________

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: John Doe Application Number: R-85-1421 Project Name: Zena Acricultural Land

State: LA County: Choctaw Legal Description: Township: 7N Range: 2E

Date: 10/08/85 Plot No.: 1-1 Section: 32

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		Herbs	
1. *Quercus lyrata*	OBL	7. *Polygonum hydropiperoides*	OBL
2. *Carya aquatica*	OBL	8. *Boehmeria cylindrica*	FACW+
3. *Gleditsia aquatica*	OBL	9. *Brunnichia cirrhosa*	--
Saplings/shurbs		Woody vines	
4. *Forestiera acuminata*	OBL	10. *Toxicodendron radicans*	FAC
5. *Planera aquatica*	OBL	11. --	--
6. --	--	12. --	--

% of species that are OBL, FACW, and/or FAC: 100%. Other indicators: --.

Hydrophytic vegetation: Yes X No ___. Basis: 50% of dominants are OBL, FACW, and/or FAC on plant list.

Soil

Series and phase: Sharkey, frequently flooded On hydric soils list? Yes X; No ___.

Mottled: Yes X; No ___. Mottle color: 5YR4/6; Matrix color: 10YR4/1.

Gleyed: Yes ___ No X. Other indicators: ___.

Hydric soils: Yes X No ___; Basis: On hydric soil list and matrix color.

Hydrology

Inundated: Yes ___; No X. Depth of standing water: --.

Saturated soils: Yes X; No ___. Depth to saturated soil: 6".

Other indicators: Drift lines and sediment deposits present on trees.

Wetland hydrology: Yes X; No ___. Basis: Saturated soils.

Atypical situation: Yes ___; No X.

Normal Circumstances?: Yes X No ___.

Wetland Determination: Wetland X; Nonwetland ___.

Comments: No rain reported from area in previous two weeks.

Determined by: Zelda Schmell (Signed)

DATA FORM 2

VEGETATION-COMPREHENSIVE DETERMINATION

Applicant Name: John Doe Application No.: R-85-1421 Project Name: Zena Agricultural Land

Location: LA (Choctaw Parish) Plot #: 1-1 Date: 10/08/85 Determined By: Zelda Schmell

VEGETATION LAYER

TREES	BASAL AREA (in^2)	TOTAL BASAL AREA	RANK	HERBS	MIDPOINT OF % COVER CLASS	RANK
1 *Quercus lyrata*	465	1,145	1	1 *Boehmeria cylindrica*	37.5	2
2 *Quercus lyrata*	680			2 *Polygonum hydropiperoides*	62.5	1
3 *Carya aquatica*	85	243	3	3 *Brunnichia ovata*	37.5	3
4 *Carya aquatica*	120			4 *Gleditsia aquatica* (seedling)	2.5	
5 *Carya aquatica*	38			5 *Eclipta alba*	2.5	
6 *Gleditsia aquatica*	235	253	2	6		
7 *Gleditsia aquatica*	18			7		
8 *Diospyros virginiana*	46	46		8		
9				9		
10				10		

SAPLINGS/SHRUBS	MIDPOINT OF HEIGHT CLASS	TOTAL HEIGHT CLASS	RANK	WOODY VINES	NUMBER OF STEMS	RANK
1 *Forestiera acuminata*	4.5	13.0	1	1 *Toxicodendron radicans*	35	1
2 *Forestiera acuminata*	4.5			2 (only woody vine present)		
3 *Forestiera acuminata*	1.5			3		
4 *Forestiera acuminata*	2.5			4		
5 *Planera aquatica*	4.5	8.0	2	5		
6 *Planera aquatica*	3.5			6		
7 *Carya aquatica*	1.5	1.5		7		
8				8		
9				9		
10				10		

DATA FORM 3

ATYPICAL SITUATIONS

Applicant Name: Wetland Developers, Inc.   Application Number: R-85-12   Project Name: Big Canal

Location: Joshua Co., MT   Plot Number: 2   Date: 10/08/85

A. VEGETATION:

1. Type of Alteration: Vegetation totally removed or covered by placement of fill from canal (1984).

2. Effect on Vegetation: None remaining.

3. Previous Vegetation: *Carex nebrascensis* - *Juncus effusus* freshwater (Attach documentation) marsh (based on contiguous plant communities and aerial photography predating fill).

4. Hydrophytic Vegetation? Yes X No ____.

B. SOILS:

1. Type of Alteration: Original soil covered by 4 feet of fill material excavated from canal.

2. Effect on Soils: Original soil buried in 1984.

3. Previous Soils: Original soil examined at 10 inches below (Attach documentation) original soil surface. Soil gleyed (color notation 5Y2/0).

4. Hydric Soils? Yes X No ____.

C. HYDROLOGY:

1. Type of Alteration: 4 feet of fill material placed on original surface.

2. Effect on Hydrology: Area no longer is inundated.

3. Previous Hydrology: Examination of color IR photography taken on 6/5/84 (Attach documentation) showed the area to be inundated. Gaging station data from gage 2 miles upstream indicated the area has been inundated for as much as 3 months of the growing season during 8 of the past 12 years.

4. Wetland Hydrology? Yes X No ____.

Characterized By: Joe Zook

APPENDIX C: VEGETATION

1. This appendix contains three sections. Section 1 is a subset of the regional list of plants that occur in wetlands, but includes only those species having an indicator status of OBL, FACW, or FAC. Section 2 is a list of plants that commonly occur in wetlands of a given region. Since many geographic areas of Section 404 responsibility include portions of two or more plant list regions, users will often need more than one regional list; thus, Sections 1 and 2 will be published separately from the remainder of the manual. Users will be furnished all appropriate regional lists.

2. Section 3, which is presented herein, describes morphological, physiological, and reproductive adaptations that can be observed or are known to occur in plant species that are typically adapted for life in anaerobic soil conditions.

Section 3 - Morphological, Physiological, and Reproductive Adaptations of Plant Species for Occurrence in Areas Having Anaerobic Soil Conditions

Morphological adaptations

3. Many plant species have morphological adaptations for occurrence in wetlands. These structural modifications most often provide the plant with increased buoyancy or support. In some cases (e.g. adventitious roots), the adaptation may facilitate the uptake of nutrients and/or gases (particularly oxygen). However, not all species occurring in areas having anaerobic soil conditions exhibit morphological adaptations for such conditions. The following is a list of morphological adaptations that a species occurring in areas having anaerobic soil conditions may possess (a partial list of species with such adaptations is presented in Table C1):

a. Buttressed tree trunks. Tree species (e.g. *Taxodium distichum*) may develop enlarged trunks (Figure C1) in response to frequent inundation. This adaptation is a strong indicator of hydrophytic vegetation in nontropical forested areas.

b. Pneumatophores. These modified roots may serve as respiratory organs in species subjected to frequent inundation or soil saturation. Cypress knees (Figure C2) are a classic example, but other species (e.g., *Nyssa aquatica*, *Rhizophora mangle*) may also develop pneumatophores.

c. Adventitious roots. Sometimes referred to as "water roots," adventitious roots occur on plant stems in positions where roots normally are not found. Small fibrous roots protruding from the base of trees (e.g. *Salix nigra*) or roots on stems of herbaceous plants and tree seedlings in positions immediately above the soil surface (e.g. *Ludwigia* spp.) occur in response to inundation or soil saturation (Figure C3). These usually develop during periods of sufficiently prolonged soil saturation to destroy most of the root system. *CAUTION: Not all adventitious roots develop as a result of inundation or soil saturation. For example, aerial roots on woody vines are not normally produced as a response to inundation or soil saturation.*

d. Shallow root systems. When soils are inundated or saturated for long periods during the growing season, anaerobic conditions develop in the zone of root growth. Most species with deep root systems cannot survive in such conditions. Most species capable of growth during periods when soils are oxygenated only near the surface have shallow root systems. In forested wetlands, windthrown trees (Figure C4) are often indicative of shallow root systems.

e. Inflated leaves, stems, or roots. Many hydrophytic species, particularly herbs (e.g. *Limnobium spongia*, *Ludwigia* spp.), have or develop spongy (aerenchymous) tissues in leaves, stems, and/or roots that provide buoyancy or support and serve as a reservoir or passageway for oxygen needed for metabolic processes. An example of inflated leaves is shown in Figure C5.

f. Polymorphic leaves. Some herbaceous species produce different types of leaves, depending on the water level at the time of leaf formation. For example, *Alisma* spp. produce strap-shaped leaves when totally submerged, but produce broader, floating leaves when plants are emergent. *CAUTION: Many upland species also produce polymorphic leaves.*

g. Floating leaves. Some species (e.g. *Nymphaea* spp.) produce leaves that are uniquely adapted for floating on a water surface (Figure C6). These leaves have stomata primarily on the upper surface and a thick waxy cuticle that restricts water penetration. The presence of species with floating leaves is strongly indicative of hydrophytic vegetation.

h. Floating stems. A number of species (e.g., *Alternanthera philoxeroides*) produce matted stems that have large internal air spaces when occurring in inundated areas. Such species root in shallow water and grow across the water surface into deeper areas. Species with floating stems often produce adventitious roots at leaf nodes.

i. Hypertrophied lenticels. Some plant species (e.g. *Gleditsia aquatica*) produce enlarged lenticels on the stem in response to prolonged inundation or soil saturation. These are thought to increase oxygen uptake through the stem during such periods.

j. Multitrunks or stooling. Some woody hydrophytes characteristically produce several trunks of different ages (Figure C7) or produce new stems arising from the base of a senescing individual (e.g. *Forestiera acuminata*, *Nyssa ogechee*) in response to inundation.

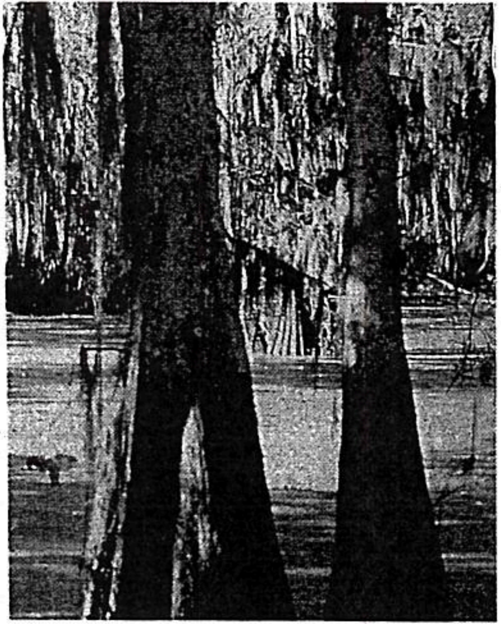

Figure C1. Buttressed tree truck (bald cypress)

Figure C2. Pneumatophores (bald cypress)

Figure C3. Adventitious roots

Figure C4. Wind-thrown tree with shallow root system

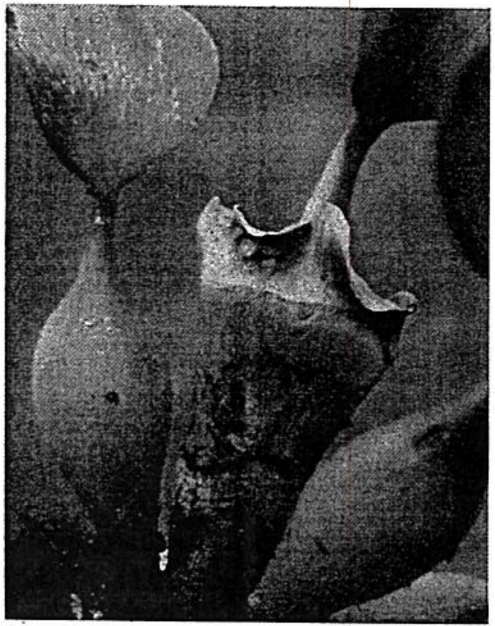

Figure C5. Inflated leaves

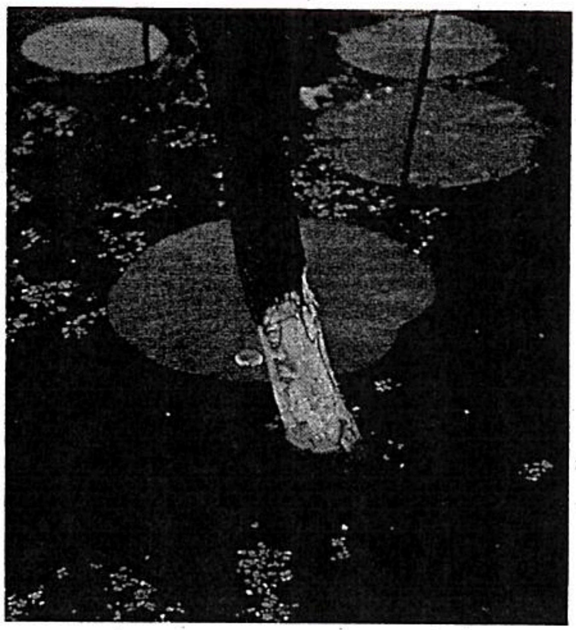

Figure C6. Floating leaves

Figure C7. Multitrunk plant

k. Oxygen pathway to roots. Some species (e.g. *Spartina alterniflora*) have a specialized cellular arrangement that facilitates diffusion of gaseous oxygen from leaves and stems to the root system.

Physiological adaptations

4. Most, if not all, hydrophytic species are thought to possess physiological adaptations for occurrence in areas that have prolonged periods of anaerobic soil conditions. However, relatively few species have actually been proven to possess such adaptations, primarily due to the limited research that has been conducted. Nevertheless, several types of physiological adaptations known to occur in hydrophytic species are discussed below, and a list of species having one or more of these adaptations is presented in Table C2. *NOTE: Since it is impossible to detect these adaptations in the field, use of this indicator will be limited to observing the species in the field and checking the list in Table C2 to determine whether the species is known to have a physiological adaptation for occurrence in areas having anaerobic soil conditions*):

a. Accumulation of malate. Malate, a nontoxic metabolite, accumulates in roots of many hydrophytic species (e.g. *Glyceria maxima*, *Nyssa sylvatica* var. *biflora*). Nonwetland species concentrate ethanol, a toxic by-product of anaerobic respiration, when growing in anaerobic soil conditions. Under such conditions, many hydrophytic species produce high concentrations of malate and unchanged concentrations of ethanol, thereby avoiding accumulation of toxic materials. Thus, species having the ability to concentrate malate instead of ethanol in the root system under anaerobic soil conditions are adapted for life in such conditions, while species that concentrate ethanol are poorly adapted for life in anaerobic soil conditions.

b. Increased levels of nitrate reductase. Nitrate reductase is an enzyme involved in conversion of nitrate nitrogen to nitrite nitrogen, an intermediate step in ammonium production. Ammonium ions can accept electrons as a replacement for gaseous oxygen in some species, thereby allowing continued functioning of metabolic processes under low soil oxygen conditions. Species that produce high levels of nitrate reductase (e.g. *Larix laricina*) are adapted for life in anaerobic soil conditions.

c. Slight increases in metabolic rates. Anaerobic soil conditions effect short-term increases in metabolic rates in most species. However, the rate of metabolism often increases only slightly in wetland species, while metabolic rates increase significantly in nonwetland species. Species exhibiting only slight increases in metabolic rates (e.g. *Larix laricina*, *Senecio vulgaris*) are adapted for life in anaerobic soil conditions.

d. Rhizosphere oxidation. Some hydrophytic species (e.g. *Nyssa aquatica, Myrica gale*) are capable of transferring gaseous oxygen from the root system into soil pores immediately surrounding the roots. This adaptation prevents root deterioration and maintains the rates of water and nutrient absorption under anaerobic soil conditions.

e. Ability for root growth in low oxygen tensions. Some species (e.g. *Typha angustifolia, Juncus effusus*) have the ability to maintain root growth under soil oxygen concentrations as low as 0.5 percent. Although prolonged (>1 year) exposure to soil oxygen concentrations lower than 0.5 percent generally results in the death of most individuals, this adaptation enables some species to survive extended periods of anaerobic soil conditions.

f. Absence of alcohol dehydrogenase (ADH) activity. ADH is an enzyme associated with increased ethanol production. When the enzyme is not functioning, ethanol production does not increase significantly. Some hydrophytic species (e.g. *Potentilla anserina, Polygonum amphibium*) show only slight increases in ADH activity under anaerobic soil conditions. Therefore, ethanol production occurs at a slower rate in species that have low concentrations of ADH.

Reproductive adaptations

5. Some plant species have reproductive features that enable them to become established and grow in saturated soil conditions. The following have been identified in the technical literature as reproductive adaptations that occur in hydrophytic species:

a. Prolonged seed viability. Some plant species produce seeds that may remain viable for 20 years or more. Exposure of these seeds to atmospheric oxygen usually triggers germination. Thus, species (e.g., *Taxodium distichum*) that grow in very wet areas may produce seeds that germinate only during infrequent periods when the soil is dewatered. *NOTE: Many upland species also have prolonged seed viability, but the trigger mechanism for germination is not exposure to atmospheric oxygen.*

b. Seed germination under low oxygen concentrations. Seeds of some hydrophytic species germinate when submerged. This enables germination during periods of early-spring inundation, which may provide resulting seedlings a competitive advantage over species whose seeds germinate only when exposed to atmospheric oxygen.

c. Flood-tolerant seedlings. Seedlings of some hydrophytic species (e.g. *Fraxinus pennsylvanica*) can survive moderate periods of total or partial inundation. Seedlings of these species have a competitive advantage over seedlings of flood-intolerant species.

Table C1

Partial List of Species With Known Morphological Adaptations for Occurrence in Wetlands*

Species	Common Name	Adaptation
Acer negundo	Box elder	Adventitious roots
Acer rubrum	Red maple	Hypertrophied lenticels
Acer saccharinum	Silver maple	Hypertrophied lenticels; adventitious roots (juvenile plants)
Alisma spp.	Water plantain	Polymorphic leaves
Alternanthera philoxeroides	Alligatorweed	Adventitious roots; inflated, floating stems
Avicennia nitida	Black mangrove	Pneumatophores; hypertrophied lenticels
Brasenia schreberi	Watershield	Inflated, floating leaves
Cladium mariscoides	Twig rush	Inflated stems
Cyperus spp. (most species)	Flat sedge	Inflated stems and leaves
Eleocharis spp. (most species)	Spikerush	Inflated stems and leaves
Forestiera acuminata	Swamp privet	Multi-trunk, stooling
Fraxinus pennsylvanica	Green ash	Buttressed trunks; adventitious roots
Gleditsia aquatica	Water locust	Hypertrophied lenticels
Juncus spp.	Rush	Inflated stems and leaves
Limnobium spongia	Frogbit	Inflated, floating leaves
Ludwigia spp.	Waterprimrose	Adventitious roots; inflated floating stems
Menyanthes trifoliata	Buckbean	Inflated stems (rhizome)
Myrica gale	Sweetgale	Hypertrophied lenticels
Nelumbo spp.	Lotus	Floating leaves
Nuphar spp.	Cowlily	Floating leaves

(Continued)

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* Many other species exhibit one or more morphological adaptations for occurrence in wetlands. However, not all individuals of a species will exhibit these adaptations under field conditions, and individuals occurring in uplands characteristically may not exhibit them.

Table C1 (Concluded)

Species	Common Name	Adaptation
Nymphaea spp.	Waterlily	Floating leaves
Nyssa aquatica	Water tupelo	Buttressed trunks; pneumatophores; adventitious roots
Nyssa ogechee	Ogechee tupelo	Buttressed trunks; multi-trunk; stooling
Nyssa sylvatica var. *biflora*	Swamp blackgum	Buttressed trunks
Platanus occidentalis	Sycamore	Adventitious roots
Populus deltoides	Cottonwood	Adventitious roots
Quercus laurifolia	Laurel oak	Shallow root system
Quercus palustris	Pin oak	Adventitious roots
Rhizophora mangle	Red mangrove	Pneumatophores
Sagittaria spp.	Arrowhead	Polymorphic leaves
Salix spp.	Willow	Hypertrophied lenticels; adventitious roots; oxygen pathway to roots
Scirpus spp.	Bulrush	Inflated stems and leaves
Spartina alterniflora	Smooth cordgrass	Oxygen pathway to roots
Taxodium distichum	Bald cypress	Buttressed trunks; pneumatophores

Table C2

Species Exhibiting Physiological Adaptations for Occurrence in Wetlands

Species	Physiological Adaptation
Alnus incana	Increased levels of nitrate reductase; malate accumulation
Alnus rubra	Increased levels of nitrate reductase
Baccharis viminea	Ability for root growth in low oxygen tensions
Betula pubescens	Oxidizes the rhizosphere; malate accumulation
Carex arenaria	Malate accumulation
Carex flacca	Absence of ADH activity
Carex lasiocarpa	Malate accumulation
Deschampsia cespitosa	Absence of ADH activity
Filipendula ulmaria	Absence of ADH activity
Fraxinus pennsylvanica	Oxidizes the rhizosphere
Glyceria maxima	Malate accumulation; absence of ADH activity
Juncus effusus	Ability for root growth in low oxygen tensions; absence of ADH activity
Larix laricina	Slight increases in metabolic rates; increased levels of nitrate reductase
Lobelia dortmanna	Oxidizes the rhizosphere
Lythrum salicaria	Absence of ADH activity
Molinia caerulea	Oxidizes the rhizosphere
Myrica gale	Oxidizes the rhizosphere
Nuphar lutea	Organic acid production
Nyssa aquatica	Oxidizes the rhizosphere
Nyssa sylvatica var. *biflora*	Oxidizes the rhizosphere; malate accumulation
Phalaris arundinacea	Absence of ADH activity; ability for root growth in low oxygen tensions
Phragmites australis	Malate accumulation
Pinus contorta	Slight increases in metabolic rates; increased levels of nitrate reductase
Polygonum amphibium	Absence of ADH activity
Potentilla anserina	Absence of ADH activity; ability for root growth in low oxygen tensions

(Continued)

Table C2 (Concluded)

Species	Physiological Adaptation
Ranunculus flammula	Malate accumulation; absence of ADH activity
Salix cinerea	Malate accumulation
Salix fragilis	Oxidizes the rhizosphere
Salix lasiolepis	Ability for root growth in low oxygen tensions
Scirpus maritimus	Ability for root growth in low oxygen tensions
Senecio vulgaris	Slight increases in metabolic rates
Spartina alterniflora	Oxidizes the rhizosphere
Trifolium subterraneum	Low ADH activity
Typha angustifolia	Ability for root growth in low oxygen tensions

APPENDIX D: HYDRIC SOILS

1. This appendix consists of two sections. Section 1 describes the basic procedure for digging a soil pit and examining for hydric soil indicators. Section 2 is a list of hydric soils of the United States.

Section 1 - Procedures for Digging a Soil Pit and Examining for Hydric Soil Indicators

Digging a soil pit

2. Apply the following procedure: Circumscribe a 1-ft-diam area, preferably with a tile spade (sharpshooter). Extend the blade vertically downward, cut all roots to the depth of the blade, and lift the soil from the hole. This should provide approximately 16 inches of the soil profile for examination. *Note: Observations are usually made immediately below the A-horizon or 10 inches (whichever is shallower).* In many cases, a soil auger or probe can be used instead of a spade. If so, remove successive cores until 16 inches of the soil profile have been removed. Place successive cores in the same sequence as removed from the hole. *Note: An auger or probe cannot be effectively used when the soil profile is loose, rocky, or contains a large volume of water (e.g. peraquic moisture regime).*

Examining the soil

3. Examine the soil for hydric soils indicators (paragraphs 44 and/or 45 of main text (for sandy soils)). *Note: It may not be necessary to conduct a classical characterization (e.g. texture, structure, etc.) of the soil.* Consider the hydric soil indicators in the following sequence *(Note: THE SOIL EXAMINATION CAN BE TERMINATED WHEN A POSITIVE HYDRIC SOIL INDICATOR IS FOUND)*:

Nonsandy soils.

- a. Determine whether an organic soil is present (see paragraph 44 of the main text). If so, the soil is hydric.
- b. Determine whether the soil has a histic epipedon (see paragraph 44 of the main text). Record the thickness of the histic epipedon on DATA FORM 1.
- c. Determine whether sulfidic materials are present by smelling the soil. The presence of a "rotten egg" odor is indicative of hydrogen sulfide, which forms only under extreme reducing conditions associated with prolonged inundation/soil saturation.
- d. Determine whether the soil has an aquic or peraquic moisture regime (see paragraph 44 of the main text). If so, the soil is hydric.

e. Conduct a ferrous iron test. A colorimetric field test kit has been developed for this purpose. A reducing soil environment is present when the soil extract turns pink upon addition of α-α-dipyridil.

f. Determine the color(s) of the matrix and any mottles that may be present. Soil color is characterized by three features: hue, value, and chroma. Hue refers to the soil color in relation to red, yellow, blue, etc. Value refers to the lightness of the hue. Chroma refers to the strength of the color (or departure from a neutral of the same lightness). Soil colors are determined by use of a Munsell Color Book (Munsell Color 1975).* Each Munsell Color Book has color charts of different hues, ranging from 10R to 5Y. Each page of hue has color chips that show values and chromas. Values are shown in columns down the page from as low as 0 to as much as 8, and chromas are shown in rows across the page from as low as 0 to as much as 8. In writing Munsell color notations, the sequence is always hue, value, and chroma (e.g. 10YR5/2). To determine soil color, place a small portion of soil** in the openings behind the color page and match the soil color to the appropriate color chip. *Note: Match the soil to the nearest color chip.* Record on DATA FORM 1 the hue, value, and chroma of the best matching color chip. *CAUTION: Never place soil on the face or front of the color page because this might smear the color chips.* Mineral hydric soils usually have one of the following color features immediately below the A-horizon or 10 inches (whichever is shallower):

(1) Gleyed soil.

Determine whether the soil is gleyed. If the matrix color best fits a color chip found on the gley page of the Munsell soil color charts, the soil is gleyed. This indicates prolonged soil saturation, and the soil is highly reduced.

(2) Nongleyed soil.

(a) Matrix chroma of 2 or less in mottled soils.**

(b) Matrix chroma of 1 or less in unmottled soils.**

(c) Gray mottles within 10 inches of the soil surface in dark (black) mineral soils (e.g., Mollisols) that do not have characteristics of (a) or (b) above.

Soils having the above color characteristics are normally saturated for significant duration during the growing season. However, hydric soils with significant coloration due to the nature of the parent material (e.g. red soils of the Red River Valley) may not exhibit chromas within the range indicated above. In such cases, this indicator cannot be used.

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* See references at the end of the main text.

** The soil must be moistened if dry at the time of examination.

g. Determine whether the mapped soil series or phase is on the national list of hydric soils (Section 2). *CAUTION: It will often be necessary to compare the profile description of the soil with that of the soil series or phase indicated on the soil map to verify that the soil was correctly mapped. This is especially true when the soil survey indicates the presence of inclusions or when the soil is mapped as an association of two or more soil series.*

h. Look for iron and manganese concretions. Look for small (>0.08-inch) aggregates within 3 inches of the soil surface. These are usually black or dark brown and reflect prolonged saturation near the soil surface.

Sandy soils.

Look for one of the following indicators in sandy soils:

a. A layer of organic material above the mineral surface or high organic matter content in the surface horizon (see paragraph 45a of the main text). This is evidenced by a darker color of the surface layer due to organic matter interspersed among or adhering to the sand particles. This is not observed in upland soils due to associated aerobic conditions.

b. Streaking of subsurface horizons (see paragraph 45c of the main text). Look for dark vertical streaks in subsurface horizons. These streaks represent organic matter being moved downward in the profile. When soil is rubbed between the fingers, the organic matter will leave a dark stain on the fingers.

c. Organic pans (see paragraph 45b of the main text). This is evidenced by a thin layer of hardened soil at a depth of 12 to 30 inches below the mineral surface.

Section 2 - Hydric Soils of the United States

4. The list of hydric soils of the United States (Table D1) was developed by the National Technical Committee for Hydric Soils (NTCHS), a panel consisting of representatives of the Soil Conservation Service (SCS), Fish and Wildlife Service, Environmental Protection Agency, Corps of Engineers, Auburn University, University of Maryland, and Louisiana State University. Keith Young of SCS was committee chairman.

5. The NTCHS developed the following definition of hydric soils:

> A hydric soil is a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation" (US Department of Agriculture (USDA) Soil Conservation Service 1985, as amended by the NTCHS in December 1986).

Criteria for hydric soils

6. Based on the above definition, the NTCHS developed the following criteria for hydric soils, and all soils appearing on the list will meet at least one criterion:

- a. "All Histosols* except Folists;
- b. Soils in Aquic suborders, Aquic subgroups, Albolls suborder, Salorthids great group, or Pell great groups of Vertisols that are:
    - (1) Somewhat poorly drained and have water table less than 0.5 ft from the surface for a significant period (usually a week or more) during the growing season, or
    - (2) Poorly drained or very poorly drained and have either:
        - (a) A water table at less than 1.0 ft from the surface for a significant period (usually a week or more) during the growing season if permeability is equal to or greater than 6.0 in/hr in all layers within 20 inches; or
        - (b) A water table at less than 1.5 ft from the surface for a significant period (usually a week or more) during the growing season if permeability is less than 6.0 in/hr in any layer within 20 inches; or
- c. Soils that are ponded for long duration or very long duration during part of the growing season; or
- d. Soils that are frequently flooded for long duration or very long duration during the growing season.

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* Soil taxa conform to USDA-SCS (1975).

7. The hydric soils list was formulated by applying the above criteria to soil properties documented in USDA-SCS (1975) and the SCS Soil Interpretation Records (SOI-5).

Use of the list

8. The list of hydric soils of the United States (Table D1) is arranged alphabetically by soil series. Unless otherwise specified, all phases of a listed soil series are hydric. In some cases, only those phases of a soil series that are ponded, frequently flooded, or otherwise designated as wet are hydric. Such phases are denoted in Table D1 by the following symbols in parentheses after the series name:

F - flooded
FF - frequently flooded
P - ponded
W - wet
D - depressional

9. Drained phases of some soil series retain their hydric properties even after drainage. Such phases are identified in Table D1 by the symbol "DR" in parentheses following the soil series name. In such cases, both the drained and undrained phases of the soil series are hydric.

CAUTION: Be sure that the profile description of the mapping unit conforms to that of the sampled soil. Also, designation of a soil series or phase as hydric does not necessarily mean that the area is a wetland. An area having a hydric soil is a wetland only if positive indicators of hydrophytic vegetation and wetland hydrology are also present.

Table D1

Hydric Soils

Soil Phase	Classification	Soil Phase	Classification
ABCAL	Typic Fluvaquents	ALTDORF (DR)	Aeric Glossaqualfs
ACASCO	Typic Haplaquolls	ALUSA	Typic Albaqualfs
ACKERMAN (DR)	Histic Humaquepts	ALVISO	Tropic Fluvaquents
ACREDALE (DR)	Typic Ochraqualfs	ALVOR	Cumulic Haplaquolls
ADATON	Typic Ochraqualfs	AMAGON	Typic Ochraqualfs
ADDICKS	Typic Argiaquolls	AMALU	Histic Placaquepts
ADEN	Aeric Ochraqualfs	AMBIA	Vertic Fluvaquents
ADLER (FF)	Aquic Udifluvents	AMBRAW (DR)	Fluvaquentic Haplaquolls
ADOLPH (DR)	Typic Haplaquolls	AMES	Typic Albaqualfs
ADRIAN (DR)	Terric Medisaprists	AMY	Typic Ochraquults
AFTON	Cumulic Haplaquolls	ANACOCO	Vertic albaqualfs
AGNAL	Cumulic Haplaquolls	ANCHOR POINT	Typic Cryaquents
AGUIRRE	Udic Pellusterts	ANCLOTE	Typic Haplaquolls
AHOLT	Vertic Haplaquolls	ANDOVER	Typic Fragiaquults
AHTANUM	Typic Duraquolls	ANDRY (DR)	Typic Argiaquolls
AIRPORT	Typic Natraquolls	ANGELICA (DR)	Aeric Haplaquepts
AKAN (DR)	Typic Haplaquepts	ANGELINA	Typic Fluvaquents
ALAKAI	Terric Troposaprists	ANKONA	Arenic Ultic Haplaquods
ALAMO	Typic Duraquolls	ANSGAR	Mollic Ochraqualfs
ALAMOSA	Typic Argiaquolls	ANTERO	Typic Haplaquepts
ALAPAHA	Arenic Plinthic	APALACHEE	Fluvaquentic Dystrochrepts
ALBANO	Typic Ochraqualfs	APISHAPA	Vertic Fluvaquents
ALBATON	Vertic Fluvaquents	APPANOOSE	Mollic Albaqualfs
ALBURZ	Fluvaquentic Haplaquolls	ARANSAS	Vertic Haplaquolls
ALDEN	Mollic Haplaquepts	ARAPAHOE (DR)	Typic Humaquepts
ALGANSEE (FF)	Aquic Udipsamments	ARAT	Typic Hydraquents
ALGOMA	Mollic Halaquepts	ARABE	Aquic Natrustalfs
ALIKCHI	Typic Glossaqualfs	ARBELA	Argiaquic Argialbolls
ALLANTON	Grossarenic Haplaquods	ARENA	Aquentic Durorthids
ALLEMANDS	Terric Medisaprists	ARGENT (DR)	Typic Ochraqualfs
ALLIGATOR	Vertic Haplaquepts	ARKABUTLA (FF)	Aeric Fluvaquents
ALLIS	Aeric Haplaquepts	ARLO	Typic Calciaquolls
ALMAVILLE	Typic Fragiaqualfs	ARMAGH	Typic Ochraquults
ALMO	Typic Fragiaqualfs	ARMENIA	Typic Argiaquolls
ALMONT	Pergelic Cryaquolls	ARMIESBURG	Fluventic Hapludolls

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
ARMIJO	Typic Torrerts	BALMAN	Aquic Calciorthids
ARNHEIM	Aeric Fluvaquents	BALSORA (FF)	Typic Ustifluvents
AROL	Typic Albaqualfs	BALTIC (DR)	Cumulic Haplaquolls
ARRADA	Typic Salorthids	BARATARI (DR)	Aeric Haplaquods
ARVESON (DR)	Typic Calciaquolls	BARBARY	Typic Hydraquents
ASHFORD	Vertic Ochraqualfs	BARBERT	Typic Argialbolls
ASHGROVE	Aeric Ochraqualfs	BARBOUR (FF)	Fluventic Dystrochrepts
ASHKUM (DR)	Typic Haplaquolls	BARNEY	Mollic Fluvaquents
ASTOR	Cumulic Haplaquolls	BARODA	Typic Argiaquolls
ATHERTON	Aeric Haplaquepts	BARRADA	Aquollic Salorthids
ATKINS	Typic Fluvaquents	BARRE	Udollic Orchraqualfs
ATLAS	Aeric Ochraqualfs	BARRONETT (DR)	Mollic Ochraqualfs
ATMORE	Plinthic Paleaquults	BARRY (DR)	Typic Argiaquolls
ATSION (DR)	Aeric Haplaquods	BASH	Fluvaquentic Dystrochrepts
AUBURNDALE (DR)	Typic Glossaqualfs	BASHAW	Typic Pelloxererts
AUFCO	Aeric Fluvaquents	BASILE	Typic Glossaqualfs
AUGSBERG (DR)	Typic Calciaquolls	BASINGER	Spodic Psammaquents
AURELIE (DR)	Aeric Haplaquepts	BATZA	Pergelic Cryaquents
AURELIUS (DR)	Histic Humaquepts	BAYBORO (DR)	Umbric Paleaquults
AUSMUS	Aquic Natrargids	BAYOU	Typic Paleaquults
AUSTWELL	Typic Haplaquepts	BAYSHORE	Typic Calciaquolls
AWBRIG	Vertic Albaqualfs	BAYUCOS	Typic Fluvaquents
AXIS	Typic Sulfaquents	BAYVI	Cumulic Haplaquolls
BACH (DR)	Mollic Haplaquepts	BEAR LAKE	Typic Calciaquolls
BACKBAY	Histic Fluvaquents	BEARVILLE (DR)	Typic Ochraqualfs
BACLIFF	Entic Pelluderts	BEAUCOUP (DR)	Fluvaquentic Haplaquolls
BADO	Typic Fragiaqualfs	BEAUFORD	Typic Haplaquolls
BADUS (DR)	Cumulic Haplaquolls	BEAUMONT	Entic Pelluderts
BAILE	Typic Ochraquults	BECKWITH	Typic Albaqualfs
BAJURA (DR)	Vertic Tropaquepts	BELHAVEN (DR)	Terric Medisaprists
BAKERSVILLE	Cumulic Humaquepts	BELINDA	Mollic Albaqualfs
BALDOCK	Typic Haplaquepts	BELKNAP (FF)	Aeric Fluvaquents
BALDWIN	Vertic Ochraqualfs	BELLEVILLE (DR)	Typic Haplaquolls
BALLAHACK (DR)	Cumulic Humaquepts	BELLINGHAM	Mollic Haplaquepts
BALM	Fluvaquentic Haploxerolls	BELLPASS	Terric Medisaprists

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
BELUGA (DR)	Typic Cryaquents	BLEND	Fluvaquentic Haplaquolls
BENITO	Udorthentic Pellusterts	BLICHTON	Arenic Plinthic Paleaquults
BERGLAND (DR)	Aeric Haplaquepts	BLOMFORD (DR)	Arenic Ochraqualfs
BERGSVIK	Terric Tropohemists	BLUE EARTH (DR)	Mollic Fluvaquents
BERINO (P)	Typic Haplargids	BLUFF	Typic Haplaquolls
BERNARD	Vertic Argiaquolls	BLUFFTON (DR)	Typic Haplaquolls
BERRYLAND	Typic Haplaquods	BOARDMAN	Typic Ochraqualfs
BERVILLE (DR)	Typic Argiaquolls	BOASH	Typic Haplaquolls
BESEMAN (DR)	Terric Borosaprists	BOCA	Arenic Ochraqualfs
BESSIE	Terric Medisaprists	BOGGY	Aeric Fluvaquents
BETHERA (DR)	Typic Paleaquults	BOHICKET	Typic Sulfaquents
BEZO	Aeric Halaquepts	BOHNLY	Mollic Fluvaquents
BIBB	Typic Fluvaquents	BOLFAR (F)	Cumulic Haplaquolls
BICKETT	Histic Humaquepts	BOLIO	Pergelic Cryohemists
BICONDOA	Fluvaquentic Haplaquolls	BONAIR	Humic Haplaquepts
BIDDEFORD	Histic Humaquepts	BONN	Glossic Natraqualfs
BIG BLUE	Typic Haplaquolls	BONNIE (DR)	Typic Fluvaquents
BIGWINDER	Typic Fluvaquents	BONO	Typic Haplaquolls
BINGHAMVILLE	Typic Haplaquepts	BOOKER (DR)	Vertic Haplaquolls
BIRCHFIELD	Histic Haplaquolls	BOOTJACK	Aeric Cryaquepts
BIRDS (DR)	Typic Fluvaquents	BOOTS (DR)	Typic Medihemists
BIRDSALL (DR)	Typic Humaquepts	BORGES	Typic Humaquepts
BISCAY (P,DR)	Typic Haplaquolls	BORUP (DR)	Typic Calciaquolls
BISHOP	Cumulic Haplaquolls	BOSSBURG	Mollic Andaquepts
BIVANS	Typic Albaqualfs	BOSWORTH	Vertic Haplaquolls
BLACK CANYON	Typic Haplaquolls	BOULDER LAKE	Aquic Chromoxererts
BLACKFOOT (FF)	Fluvaquentic Haploxerolls	BOWDOIN (P)	Udorthentic Chromusterts
BLACKHOOF (DR)	Histic Humaquepts	BOWDRE (F)	Fluvaquentic Hapludolls
BLACKLOCK	Typic Sideraquuods	BOWMANSVILLE	Aeric Fluvaquents
BLACKOAR	Fluvaquentic Haplaquolls	BOWSTRING	Fluvaquentic Borosaprists
BLACKWELL	Typic Cryaquolls	BOYCE	Cumulic Haplaquolls
BLADEN (DR)	Typic Albaquults	BRADENTON	Typic Ochraqualfs
BLAGO	Typic Umbraquults	BRADWAY	Pergelic Cryaquepts
BLANCHESTER	Typic Orchraqualfs	BRALLIER	Typic Tropohemists
BLEAKWOOD	Typic Fluvaquents	BRAND	Aeric Haplaquepts

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
BRAZORIA (D)	Typic Chromuderts	CABARTON	Typic Cryaquolls
BRECKENRIDGE (DR)	Mollic Haplaquepts	CABLE (DR)	Typic Haplaquepts
BREMER	Typic Argiaquolls	CADDO	Typic Glossaqualfs
BRENNER	Aeric Tropaquepts	CAIRO (DR)	Vertic Haplaquolls
BREVORT (DR)	Mollic Haplaquents	CALAMINE (DR)	Typic Argiaquolls
BRIDGESON	Fluvaquentic Haplaquolls	CALCO (DR)	Cumulic Haplaquolls
BRIGHTON	Typic Medifibrists	CALCOUSTA (DR)	Typic Haplaquolls
BRIMSTONE	Glossic Natraqualfs	CALHOUN	Typic Glossaqualfs
BRINKERTON	Typic Fragiaqualfs	CALLOWAY (F)	Glossaquic Fragiudalfs
BRINNUM	Typic Halaquepts	CANADICE	Typic Ochraqualfs
BRISCOT (FF)	Aeric Fluvaquents	CANADAIGUA (DR)	Mollic Haplaquepts
BRITTO	Typic Natraqualfs	CANBURN	Cumulic Haplaquolls
BROCKTON	Humic Fragiaquepts	CANISTEO (DR)	Typic Haplaquolls
BROOKLYN (DR)	Mollic Albaqualfs	CANOVA	Typic Glossaqualfs
BROOKMAN (DR)	Typic Umbraqualfs	CANTEY (DR)	Typic Albaquults
BROOKSTON (DR)	Typic Argiaquolls	CAPAY (F)	Typic Chromoxererts
BROPHY (DR)	Hemic Borofibrists	CAPE	Typic Fluvaquents
BROWNSDALE (DR)	Mollic Ochraqualfs	CAPE FEAR (DR)	Typic Umbraquults
BROWNTON	Typic Haplaquolls	CAPEHORN	Aeric Cryaquepts
BRUCE (DR)	Mollic Haplaquepts	CAPERS	Typic Sulfaquents
BRUIN (F)	Fluvaquentic Eutrochrepts	CAPLEN	Typic Hydraquents
BRUNEEL	Aquic Haploxerolls	CAPLES	Mollic Fluvaquents
BRYCE	Typic Haplaquolls	CAPTIVA	Mollic Psammaquents
BUCKLEY	Typic Humaquepts	CARBONDALE (DR)	Hemic Borosaprists
BULLWINKLE	Terric Borosaprists	CARLIN	Hydric Medihemists
BUNKERHILL	Typic Salorthids	CARLISLE (DR)	Typic Medisaprists
BURKEVILLE	Aquentic Chromuderts	CARLOS (DR)	Limnic Borohemists
BURLEIGH (DR)	Mollic Haplaquents	CARLOW	Vertic Haplaquolls
BURNHAM	Typic Haplaquepts	CARON (DR)	Limnic Medihemists
BURR	Typic Calciaquolls	CARTECAY (P)	Aquic Udifluvents
BURSLEY	Aeric Glossaqualfs	CARTERET	Typic Psammaquents
BURT	Lithic Psammaquents	CARUTHERSVILLE (FF)	Typic Udifluvents
BUTTON	Aeric Haplaquents	CARWILE	Typic Argiaquolls
BUXIN (FF)	Vertic Hapludolls	CARYTOWN	Albic Natraqualfs
BYARS (DR)	Umbric Paleaquults	CASCILLA (FF)	Fluventic Dystrochrepts

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
CATHRO (DR)	Terric Borosaprists	CHUMMY	Typic Humaquepts
CATMAN	Vertic Ustifluvents	CIENO	Typic Ochraqualfs
CAYAGUA	Aeric Tropaqualfs	CISNE	Mollic Albaqualfs
CEBOYA	Typic Haplaquolls	CLAM GULCH	Humic Cryaquepts
CERESCO (FF)	Fluvaquentic Hapludolls	CLAMO (DR)	Cumulic Haplaquolls
CHAIRES	Alfic Haplaquods	CLARINDA	Typic Argiaquolls
CHALMERS (DR)	Typic Haplaquolls	CLATSOP	Histic Humaquepts
CHANCE	Mollic Haplaquepts	CLEAR LAKE	Typic Pelloxererts
CHANCELLOR	Typic Argiaquolls	CLEARBROOK	Aeric Ochraquults
CHARITON	Mollic Albaqualfs	CLEARWATER	Typic Haplaquolls
CHARLES	Aeric Fluvaquents	CLERMONT	Typic Ochraqualfs
CHARLOTTE	Entic Sideraquods	CLODINE	Typic Ochraqualfs
CHASTAIN	Typic Fluvaquents	CLOTHO	Typic Haplaquolls
CHATEAU (P)	Aquic Xerochrepts	CLOVELLY	Terric Medisaprists
CHATUGE (DR)	Typic Ochraquults	CLUNIE	Terric Borofibrists
CHAUNCEY	Typic Argialbolls	CLYDE	Typic Haplaquolls
CHEEKTOWAGA	Typic Haplaquolls	COAL CREEK (DR)	Humic Cryaquepts
CHENNEBY (P)	Fluvaquentic Dystrochrepts	COATSBURG	Typic Argiaquolls
CHEQUEST	Typic Haplaquolls	COBBSFORK	Typic Ochraqualfs
CHEROKEE	Typic Albaqualfs	COCHINA (FF)	Entic Chromusterts
CHETCO	Fluvaquentic Humaquepts	COCODRIE (FF)	Aquic Udifluvents
CHIA	Terric Tropohemists	COCOLALLA	Mollic Andaquepts
CHICKAHOMINY (DR)	Typic Ochraquults	COESSE (DR)	Aeric Fluvaquents.
CHICKREEK	Andaqueptic Cryaquents	COHOCTAH (DR)	Fluvaquentic Haplaquolls
CHILGREN	Typic Ochraqualfs	COKESBURY	Typic Fragiaquults
CHILKOOT	Typic Cryaquents	COLAND	Cumulic Haplaquolls
CHINCHALLO	Andic Cryaquepts	COLEMANTOWN (DR)	Typic Ochraquults
CHINKOTEAGUE	Typic Sulfaquents	COLITA	Typic Glossaqualfs
CHIPPENY	Lithic Borosaprists	COLLINS (FF)	Aquic Udifluvents
CHIPPEWA	Typic Fragiaquepts	COLO	Cumulic Haplaquolls
CHIVATO	Cumulic Haplaquolls	COLUMBIA (FF)	Aquic Xerofluvents
CHOBEE	Typic Argiaquolls	COLUMBUS (FF)	Aquic Hapludults
CHOCK	Andaqueptic Cryaquents	COLVILLE	Fluvaquentic Haplaquolls
CHOCORUA (DR)	Terric Borohemists	COLVIN (DR)	Typic Calciaquolls
CHOWAN	Thapto-Histic Fluvaquents	COLWOOD (DR)	Typic Haplaquolls

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
COMFREY (DR)	Cumulic Haplaquolls	CRAIGMILE (DR)	Fluvaquentic Haplaquolls
COMMERCE (FF)	Aeric Fluvaquents	CREOLE	
CONABY (DR)	Histic Humaquepts	CRIMS	Terric Medihemists
CONBOY	Aeric Mollic Andaquepts	CROATAN (DR)	Terric Medisaprists
CONCORD	Typic Ochraqualfs	CROOKED CREEK	Cumulic Haplaquolls
CONDIT	Typic Ochraqualfs	CROQUIB	Typic Tropaquepts
CONNEAUT	Aeric Haplaquepts	CROSSPLAIN	Typic Argiaquolls
CONRAD (DR)	Typic Psammaquents	CROTON	Typic Fragiaqualfs
CONSER	Typic Argiaquolls	CROWCAMP	Calcic Pachic Argixerolls
CONTEE	Vertic Haplaquepts	CROWTHER	Typic Calciaquolls
CONVENT (FF)	Aeric Fluvaquents	CRUMP	Histic Humaquepts
COOK	Mollic Haplaquents	CUDAHY	Petrocalcic Calciaquolls
COPANO	Vertic Albaqualfs	CUMMINGS	Mollic Andaquepts
COPELAND	Typic Argiaquolls	CURRITUCK	Terric Medisaprists
COPPER RIVER	Histic Pergelic Cryaquepts	CURTISVILLE	Typic Haplaquolls
COPSEY	Vertic Haplaquolls	CUSTER	Typic Sideraquods
COQUAT	Udortheutic Chromusterts	CYCLONE (DR)	Typic Argiaquolls
COQUILLE	Aeric Tropic Fluvaquents	DACOSTA	Vertic Ochraqualfs
CORDOVA	Typic Argiaquolls	DADINA	Histic Pergelic Cryaquepts
CORIFF	Typic Haplaquolls	DALEVILLE	Typic Paleaquults
CORLEY	Argiaquic Argialbolls	DAMASCUS	Typic Ochraqualfs
CORMANT (P,DR)	Mollic Psammaquents	DAMON	Cumulic Cryaquolls
COROZAL	Aquic Tropudults	DANCY (DR)	Aeric Glossaqualfs
CORRIGAN	Typic Albaqualfs	DANGBURG (W)	Aquic Haplic Nadurargids
CORUNNA (DR)	Typic Haplaquolls	DANIA	Lithic Medisaprists
COSUMNES (FF)	Aquic Xerofluvents	DANNEMORA	Typic Fragiaquepts
COUGARBAY	Fluvaquentic Haplaquolls	DARE (DR)	Typic Medisaprists
COURTNEY	Abruptic Argiaquolls	DARFUR	Typic Haplaquolls
COUSHATTA (F)	Fluventic Eutrochrepts	DARWIN (DR)	Vertic Haplaquolls
COVE	Vertic Haplaquolls	DASHER (DR)	Typic Medihemists
COVELAND	Aquic Palexeralfs	DASSEL	Typic Haplaquolls
COVINGTON	Mollic Ochraqualfs	DAWHOO (DR)	Typic Humaquepts
COWDEN	Mollic Albaqualfs	DAWSON	Terric Borosaprists
COXVILLE (DR)	Typic Paleaquults	DAYTON	Typic Albaqualfs
CRADLEBAUGH	Duric Haplaquolls	DEBORAH	Histic Pergelic Cryaquepts

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
DECHEL	Tropic Fluvaquents	DORAVAN	Typic Medisaprists
DECKERVILLE	Cumulic Humaquepts	DOSPALOS (F)	Vertic Haplaquolls
DEERWOOD (DR)	Histic Humaquepts	DOTLAKE	Pergalic Cryaquepts
DEFORD (DR)	Typic Psammaquents	DOUGCLIFF	Typic Borofibrists
DEKOVEN	Fluvaquentic Haplaquolls	DOVRAY (DR)	Cumulic Haplaquolls
DELCOMB	Terric Medisaprists	DOWELLTON	Vertic Ochraqualfs
DELENA	Humic Fragiaquepts	DOWNATA	Cumulic Haplaquolls
DELEPLAIN	Aeric Fluvaquents	DOYLESTOWN	Typic Fraqiaqualfs
DELFT	Cumulic Haplaquolls	DRIFTWOOD	Typic FLuvaquents
DELKS	Ultic Haplaquods	DRUMMER (DR)	Typic Haplaquolls
DELOSS (DR)	Typic Umbraquults	DUNNING	Fluvaquentic Haplaquolls
DELRAY	Grossarenic Argiaquolls	DUPONT	Limnic Medisaprists
DENAUD	Histic Humaquepts	DURBIN	Typic Sulfihemists
DENNY (DR)	Mollic Albaqualfs	DURRSTEIN	Typic Natraquolls
DEPOE	Typic Tropaquods	DYLAN	Aquentic Chromuderts
DEPORT	Udorthentic Pellusterts	EACHUSTON	Typic Cryaquents
DERLY	Typic Glossaqualfs	EARLE	Vertic Haplaquepts
DESHA (FF)	Vertic Hapludolls	EARLMONT	Typic Fluvaquents
DEVILSGAIT	Cumulic Haplaquolls	EASBY	Typic Calciaquolls
DEVOIGNES	Histic Humaquepts	EASLEY	Histic Pergelic Cryaquepts
DEWEYVILLE	Typic Medihemists	EASTON (DR)	Aeric Haplaquepts
DIANOLA	Typic Psammaquents	EATON	Arenic Albaqualfs
DILMAN	Typic Cryaquolls	EAUGALLIE	Alfic Haplaquods
DILTON	Lithic Haplaquolls	EBBERT (DR)	Argiaquic Argialbolls
DIMMICK (DR)	Typic Haplaquolls	EBRO	Typic Medisaprists
DINGLISHNA	Typic Cryaquods	EDGINGTON (DR)	Argiaquic Argialbolls
DIPMAN	Typic Cryaquolls	EDINA	Typic Argialbolls
DIREGO	Terric Sulfihemists	EDINBURG (DR)	Typic Argiaquolls
DITHOD	Fluvaquentic Haploxerolls	EDMINSTER	Glossic Natraqualfs
DOBROW	Cumulic Cryaquolls	EDMONDS	Entic Sideraquods
DOCKERY (FF)	Aquic Udifluvents	EDMORE (DR)	Mollic Haplaquents
DOGIECREEK	Typic Fluvaquents	EDNA	Vertic Albaqualfs
DOLBEE	Typic Haplaquolls	EDROY	Vertic Haplaquolls
DORA (DR)	Terric Borosaprists	EDWARDS (DR)	Liminic Medisaprists
DOROSHIN	Terric Borohemists	EGAS	Typic Haplaquolls

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
EGBERT	Cumulic Haplaquolls	EVADALE	Typic Glossaqualfs
ELBERT	Typic Ochraqualfs	EVANSHAM (DR)	Typic Pelluderts
ELIZA	Sulfic Fluvaquents	EVANSVILLE	Typic Haplaquepts
ELKINS	Humaqueptic Fluvaquents	EVART	Fluvaquentic Haplaquolls
ELKTON	Typic Ochraquults	EVERGLADES (DR)	Typic Medihemists
ELLABELLE (DR)	Arenic Umbric Paleaquults	EVERSON	Mollic Haplaquepts
ELLOREE	Arenic Ochraqualfs	EYAK	Typic Cryaquents
ELLZEY	Arenic Ochraqualfs	FALAYA (FF)	Aeric Fluvaquents
ELM LAKE (DR)	Typic Haplaquents	FALBA	Typic Albaqualfs
ELPAM	Typic Haplaquepts	FALLON (F)	Aquic Xerofluvents
ELRED	Alfic Sideraquods	FALLSINGTON	Typic Ochraquults
ELRICK (FF)	Typic Hapludolls	FALOMA	Fluvaquentic Haplaquolls
ELVERS (DR)	Thapto-Histic Fluvaquents	FARGO (DR)	Vertic Haplaquolls
ELVIRA	Typic Haplaquolls	FARMTON	Arenic Ultic Haplaquods
EMDENT	Mollic Halaquepts	FAUSSE	Typic Fluvaquents
EMERALDA	Mollic Albaqualfs	FAXON (DR)	Typic Haplaquolls
EMORY (P)	Fluventic Umbric Dystrochrepts	FEATHERSTONE	Typic Hydraquents
ENGLEHARD (DR)	Humaqueptic Fluvaquents	FEDORA	Typic Calciaquolls
ENLOE (DR)	Argiaquic Argialbolls	FELDA	Arenic Ochraqualfs
ENOCHVILLE	Cumulic Cryaquolls	FELLOWSHIP	Typic Umbraqualfs
ENOREE (DR)	Aeric Fluvaquents	FERRON	Typic Fluvaquents
ENOSBURG (DR)	Mollic Haplaquents	FIELDON	Typic Haplaquolls
ENSLEY (DR)	Aeric Haplaquepts	FILION	Typic Haplaquepts
EPOUFETTE (DR)	Mollic Ochraqualfs	FILLMORE	Typic Argialbolls
EQUIS	Typic Halaquepts	FISHTRAP	Terric Medisaprists
ERAMOSH	Histic Haplaquolls	FLAGSTAFF	Haploxerollic Durargids
ESHAMY	Typic Cryaquents	FLEER	Cumulic Cryaquolls
ESPELIE	Typic Haplaquolls	FLEMINGTON	Typic Albaqualfs
ESRO	Cumulic Haplaquolls	FLOM (DR)	Typic Haplaquolls
ESSEXVILLE (DR)	Typic Haplaquolls	FLORIDANA	Arenic Argiaquolls
ESTER	Histic Pergelic Cryaquepts	FOLEY	Albic Glossic Natraqualfs
ESTERO	Typic Haplaquods	FOLLET	Typic Haplaquents
ESTES	Aeric Haplaquepts	FONDA	Mollic Haplaquepts
ETTRICK (DR)	Fluvaquentic Haplaquolls	FORADA	Typic Haplaquolls
EUREKA	Typic Albaqualfs	FORD (DR)	Aeric Calciaquolls
EUTAW	Entic Pelluderts		

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
FORDUM	Mollic Fluvaquents	GAY (DR)	Aeric Haplaquepts
FORELAND	Histic Cryaquepts	GAYLESVILLE	Aeric Ochraqualfs
FORESTDALE	Typic Ochraqualfs	GAZELLE	Aquic Durothids
FORNEY	Vertic Fluvaquents	GED	Typic Ochraqualfs
FORTESCUE (DR)	Cumulic Humaquepts	GENTILLY	Typic Hydraquents
FOSSUM (DR)	Typic Haplaquolls	GENTRY	Arenic Argiaquolls
FOUNTAIN	Typic Glossaqualfs	GERRARD	Typic Haplaquolls
FOURLOG	Typic Cryaquolls	GESSNER	Typic Glossaqualfs
FOXCREEK	Typic Cryaquolls	GETZVILLE	Aeric Haplaquepts
FRANCITAS	Typic Pelluderts	GIDEON	Mollic Fluvaquents
FRANKFORT	Udollic Ochraqualfs	GIFFORD	Vertic Ochraqualfs
FREDON	Aeric Haplaquepts	GILBERT	Typic Glossaqualfs
FREE (DR)	Typic Haplaquolls	GILFORD (DR)	Typic Haplaquolls
FREETOWN	Typic Medisaprists	GILLSBURG (FF)	Aeric Fluvaquents
FRENCHTOWN	Typic Fragiaqualfs	GINAT	Typic Fragiaqualfs
FRIES	Typic Umbraquults	GIRARD	Cumulic Haplaquolls
FROLIC (F)	Cumulic Haploborolls	GIRARDOT	Typic Cryaquepts
FROST	Typic Glossaqualfs	GLADEWATER	Vertic Haplaquepts
FT. DRUM	Aeric Haplaquepts	GLENCOE (DR)	Cumulic Haplaquolls
FT. GREEN	Arenic Ochraqualfs	GLENDORA (DR)	Mollic Psammaquents
FULDA (DR)	Typic Haplaquolls	GLENROSS	Typic Natraqualfs
FULMER	Typic Haplaquolls	GLENSTED	Mollic Albaqualfs
FULTS	Vertic Haplaquolls	GODFREY	Typic Fluvaquents
FUNTER	Terric Sphagnofibrists	GOLD CREEK	Vertic Haplaquolls
FURNISS	Typic Cryaquolls	GOLDSTREAM	Histic Pergelic Cryaquepts
FURY	Cumulic Haplaquolls	GOODPASTER	Histic Pergelic Cryaquepts
GALLION (FF)	Typic Hapludalfs	GOOSE LAKE	Typic Argialbolls
GALT (F,P)	Typic Chromoxererts	GOREEN	Typic Albaquults
GANNETT	Typic Haplaquolls	GORHAM (DR)	Fluvaquentic Haplaquolls
GANSNER (P)	Typic Haplaquolls	GOTHENBURG	Typic Psammaquents
GAPO	Typic Cryaquolls	GRADY	Typic Paleaquults
GARROCHALES	Liminic Troposaprists	GRANBY (DR)	Typic Haplaquolls
GARWIN	Typic Haplaquolls	GRANO (DR)	Vertic Haplaquolls
GAS CREEK	Typic Haplaquolls	GRANTHAM (DR)	Typic Paleaquults
GATOR (DR)	Terric Medisaprists	GRAVELTON (DR)	Fluvaquentic Haplaquolls

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
GRAYLAND	Haplic Andaquepts	HATBORO	Typic Fluvaquents
GREENWOOD (DR)	Typic Borohemists	HAUG (DR)	Histic Humaquepts
GRENADA (F)	Glossic Fragiudalfs	HAULINGS	Histic Haplaquolls
GRIFTON (DR)	Typic Ochraqualfs	HAVELOCK	Cumulic Haplaquolls
GRIVER	Aquic Xerofluvents	HAVERHILL	Typic Haplaquolls
GROOM	Aeric Ochraqualfs	HAYNIE (FF)	Mollic Udifluvents
GRULLA	Vertic Fluvaquents	HAYSPUR	Fluvaquentic Haplaquolls
GRYGLA (DR)	Mollic Haplaquents	HAYTI	Typic Fluvaquents
GUANICA	Udic Pellusterts	HEBO	Umbric Tropaquults
GUFFIN	Mollic Haplaquepts	HECETA	Typic Psammaquents
GULF	Aeric Haplaquepts	HEGNE (DR)	Typic Calciaquolls
GUMBOOT	Typic Humaquepts	HEIGHTS	Arenic Ochraqualfs
GUTHRIE	Typic Fragiaquults	HEIL	Typic Natraquolls
GUYTON	Typic Glossaqualfs	HENCO	Grossarenic Paleaquults
HAGGA	Typic Fluvaquents	HENRIETTA (DR)	Histic Humaquepts
HAGGERTY	Aeric Ochraquults	HENRY	Typic Fragiaqualfs
HAIG	Typic Argiaquolls	HEROD	Typic Fluvaquents
HALBERT	Histic Placaquepts	HERSHAL	Cumulic Haplaquolls
HALLANDALE	Lithic Psammaquents	HERTY	Vertic Albaqualfs
HALLECK	Cumulic Haplaquolls	HESSEL (DR)	Mollic Haplaquepts
HALSEY (DR)	Mollic Haplaquepts	HETTINGER (DR)	Mollic Haplaquepts
HAMAR	Typic Haplaquolls	HEWITT	Terric Borohemists
HAMEL	Typic Argiaquolls	HIGGINS	Typic Haplaquepts
HAMRE (DR)	Histic Humaquepts	HILINE	Typic Cryaquents
HANDSBORO	Typic Sulfihemists	HILLET	Typic Haplaquolls
HANSKA	Typic Haplaquolls	HILOLO	Mollic Ochraqualfs
HAPUR	Typic Calciaquolls	HOBCAW (DR)	Typic Umbraquults
HARAHAN	Vertic Haplaquepts	HOBONNY	Typic Medisaprists
HARCOT	Typic Calciaquolls	HOBUCKEN	Typic Hydraquents
HARJO	Typic Fluvaquents	HODGE	Typic Udipsamments
HARPS	Typic Calciaquolls	HODGINS (D)	Ustollic Camborthids
HARPSTER (DR)	Typic Calciaquolls	HOFFLAND	Typic Calciaquolls
HARRIET	Typic Natraquolls	HOLILLIPAH (FF)	Typic Xerofluvents
HARRIS	Typic Haplaquolls	HOLLOW	Typic Cryofluvents
HARTSBURG (DR)	Typic Haplaquolls	HOLLY	Typic Fluvaquents

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
HOLLY SPRINGS	Cumulic Haplaquolls	INSAK	Typic Tropaquents
HOLOPAW	Grossarenic Ochraqualfs	IPSWICH	Typic Sulfihemists
HOMOSASSA	Typic Sulfaquents	IRIM	Typic Haplaquolls
HONTOON (DR)	Typic Medisaprists	IROQUOIS (DR)	Typic Argiaquolls
HOODOO	Mollic Andaquepts	ISAN (DR)	Typic Haplaquolls
HOOSIERVILLE	Typic Ochraqualfs	ISANTI (DR)	Typic Haplaquolls
HOUGHTON (DR)	Typic Medisaprists	ISLES	Arenic Ochraqualfs
HOUK	Argiaquic Xeric Argialbolls	ISTOKPOGA	Typic Medihemists
HOULKA (FF)	Vertic Haplaquepts	IVIE	Torriorthentic Haploxerolls
HOVDE	Typic Psammaquents	JACKPORT	Vertic Ochraqualfs
HOVEN	Typic Natraquolls	JACOB	Vertic Haplaquepts
HOVERT	Aquic Natrargids	JACOBSEN	Histic Cryaquepts
HOYTVILLE	Mollic Ochraqualfs	JAMES	Cumulic Haplaquolls
HUEY	Typic Natraqualfs	JAMESTON	Typic Argiaquolls
HUICHICA (P)	Abruptic Haplic Durixeralfs	JAREALES	Thapto-Histic Tropic Fluvaquents
HUMBOLDT	Fluvaquentic Haplaquolls	JAROLA	Typic Argialbolls
HUMESTON	Argiaquic Argialbolls	JARRON	Typic Natraqualfs
HUNCHBACK	Cumulic Cryaquolls	JASCO	Typic Fragiaqualfs
HUSSA	Fluvaquentic Haplaquolls	JEDDO (DR)	Aeric Ochraqualfs
HYDABURG	Lithic Cryohemists	JEFFERS	Typic Haplaquolls
HYDE (DR)	Typic Umbraquults	JENA (FF)	Fluventic Dystrochrepts
IBERIA	Vertic Haplaquolls	JOENEY	Typic Sideraquods
ICARIA (DR)	Typic Umbraquults	JOHNSTON (DR)	Cumulic Humaquepts
ICENE	Aquic Camborthids	JOICE	Typic Medisaprists
ICESLEW	Typic Haplaquepts	JOLIET	Lithic Haplaquolls
IGUALDAD	Typic Tropaquepts	JOSEPH	Aquic Xerofluvents
IJAM	Vertic Fluvaquents	JUBILEE	Typic Haplaquolls
ILACHETOMEL	Typic Sulfihemists	JUDICE	Vertic Haplaquolls
ILION	Mollic Ochraqualfs	JUNTURA	Cumulic Haplaquolls
IMMOKALEE	Arenic Haplaquods	JUPITER	Lithic Haplaquolls
INCELL	Cumulic Haplaquolls	JURVANNAH	Typic Cryaquents
INEZ	Typic Albaqualfs	KADE	Typic Cryaquents
INKOM	Cumulic Haplaquolls	KAIKLI	Lithic Cryosaprists
INKOSR	Typic Tropaquepts	KALIFONSKY	Typic Cryaquepts
INMACHUK	Pergelic Cryofibrists	KALIGA	Terric Medisaprists

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
KALMARVILLE	Mollic Fluvaquents	KIMMERLING	Cumulic Haplaquolls
KALOKO	Typic Calciaquolls	KINA	Typic Cryohemists
KALONA	Typic Haplaquolls	KINDER	Typic Glossaqualfs
KAMAN	Typic Pelluderts	KINGILE	Terric Medisaprists
KANAPAHA	Grossarenic Paleaquults	KINGMAN	Fluvaquentic Haplaquolls
KANEBREAK	Cumulic Haplaquolls	KINGS (DR)	Vertic Haplaquolls
KANONA	Aeric Haplaquepts	KINGSLAND	Typic Medihemists
KANTISHNA	Hydric Borofibrists	KINGSVILLE (DR)	Mollic Psammaquents
KANUTCHAN	Typic Pelloxererts	KINKORA	Typic Ochraquults
KANZA	Mollic Psammaquents	KINROSS (DR)	Typic Haplaquods
KARANKAWA	Typic Haplaquents	KINSMAN (DR)	Aeric Haplaquods
KARHEEN	Typic Cryosaprists	KINSTON (DR)	Typic Fluvaquents
KARLUK	Typic Cryaquepts	KIRK	Andic Cryaquepts
KARNAK	Vertic Haplaquepts	KIZHUYAK	Andaqueptic Cryaquents
KARSHNER	Pergelic Cryaquepts	KJAR	Histic Humaquepts
KATO (DR)	Typic Haplaquolls	KLABER	Typic Glossaqualfs
KAUFMAN	Typic Pelluderts	KLAMATH	Cumulic Cryaquolls
KEALIA	Typic Salorthids	KLANELNEECHENA	Histic Pergelic Cryaquepts
KEANSBURG	Typic Umbraquults	KLAWASI	Histic Pergelic Cryaquepts
KEECHI	Typic Fluvaquents	KNIGHT	Argiaquic Argialbolls
KENNER	Fluvaquentic Medisaprists	KNOKE (DR)	Cumulic Haplaquolls
KENUSKY	Umbric Paleaquults	KOBEL	Vertic Haplaquepts
KEOWNS (DR)	Mollic Haplaquepts	KOGISH	Typic Sphagnofibrists
KERSTON (DR)	Fluvaquentic Medisaprists	KOKOMO	Typic Argiaquolls
KESSON	Typic Pasammaquents	KOLLS	Vertic Haplaquolls
KESTERSON	Glossic Natraqualfs	KOLLUTUK	Pergelic Ruptic-Histic Cryaquepts
KETONA	Vertic Ochraqualfs	KOOLAU	Plinthic Tropaquepts
KEYESPOINT (FF)	Vertic Haplaquepts	KOSMOS	Typic Humaquepts
KEZAN	Mollic Fluvaquents	KOSSUTH	Typic Haplaquolls
KIAN	Aeric Fluvaquents	KOTO	Typic Natraquolls
KILGORE	Cumulic Cryaquolls	KOURY (FF)	Fluvaquentic Dystrochrepts
KILLBUCK	Typic Fluvaquents	KOVICH	Cumulic Haplaquolls
KILLEY	Typic Cryaquents	KRATKA (DR)	Typic Haplaquolls
KILMANAGH (DR)	Aeric Haplaquepts	KUSKOKWIM	Histic Pergelic Cryaquepts
KILWINNING	Vertic Ochraqualfs	KUSLINA	Histic Pergelic Cryaquepts

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
KYDAKA	Typic Humaquepts	LAWET	Typic Calciaquolls
LABISH	Cumulic Humaquepts	LAWNWOOD	Aeric Haplaquods
LABOUNTY	Typic Humaquepts	LAWSON (FF)	Cumulic Hapludolls
LACAMAS	Typic Glossaqualfs	LEAF	Typic Albaquults
LACERDA	Aquentic Chromuderts	LEAGUEVILLE	Arenic Paleaquults
LACHAPELLA	Typic Cryaquepts	LEAKSVILLE	Typic Albaqualfs
LACOOCHEE	Spodic Psammaquents	LEBEAU	Aquentic Chromuderts
LACOTA (DR)	Mollic Haplaquepts	LEDWITH	Mollic Albaqualfs
LAFITTE	Typic Medisaprists	LEE	Typic Fluvaquents
LAGRANGE	Typic Ochraqualfs	LEICESTER	Aeric Haplaquepts
LAHRITY	Mollic Haplaquepts	LEMETA	Pergelic Cryofibrists
LAJARA	Typic Haplaquolls	LEMOLO	Typic Humaquepts
LAKE CHARLES	Typic Pelluderts	LEMOND (DR)	Typic Haplaquolls
LAKEMONT	Udollic Ochraqualfs	LENA (DR)	Typic Medisaprists
LAKESHORE	Typic Salorthids	LENAWEE (DR)	Mollic Haplaquepts
LALLIE (DR)	Typic Fluvaquents	LENOIR (FF)	Aeric Paleaquults
LAM	Fluvaquentic Haplaquolls	LEON	Aeric Haplaquods
LAMINGTON	Typic Fragiaquults	LEONARD	Vertic Ochraqualfs
LAMO	Cumulic Haplaquolls	LEONARDTOWN	Typic Fragiaquults
LAMOOSE	Typic Haplaquolls	LETON	Typic Glossaqualfs
LAMOURE (DR)	Cumulic Haplaquolls	LETRI	Typic Haplaquolls
LAMSON (DR)	Aeric Haplaquepts	LEVASY	Fluvaquentic Haplaquolls
LANEXA	Terric Medisaprists	LEVELTON	Typic Haplaquepts
LANG (FF)	Typic Psammaquents	LEVY	Typic Hydraquents
LANGLOIS	Tropic Fluvaquents	LICKDALE	Humic Haplaquepts
LANTON (DR)	Cumulic Haplaquolls	LIDDELL (DR)	Typic Haplaquepts
LANTZ	Typic Umbraqualfs	LIGHTNING	Typic Ochraqualfs
LANYON	Typic Haplaquolls	LILBOURN	Aeric Fluvaquents
LAROSE	Typic Hydraquents	LIM (DR)	Aeric Fluvaquents
LARRY	Typic Haplaquolls	LIMERICK	Typic Fluvaquents
LATAHCO	Argiaquic Xeric Argialbolls	LINDAAS (DR)	Typic Argiaquolls
LATHER	Limnic Borohemists	LINWOOD (DR)	Terric Medisaprists
LATTY	Typic Haplaquepts	LIPAN	Entic Pellusterts
LAUDERHILL (DR)	Lithic Medisaprists	LIPPINCOTT	Typic Argiaquolls
LAUGENOUR (FF)	Aeric Fluvaquents	LISCO	Typic Halaquepts

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
LITRO	Vertic Haplaquepts	MACKEN	Vertic Haplaquolls
LIVIA	Typic Natraqualfs	MADALIN	Mollic Ochraqualfs
LIVINGSTON (DR)	Mollic Haplaquepts	MADELIA	Typic Haplaquolls
LOBO	Hemic Sphagnofibrists	MAGNA	Typic Calciaquolls
LOCODA	Typic Fluvaquents	MAGOTHA	Typic Natraqualfs
LOGAN	Typic Calciaquolls	MAHALASVILLE (DR)	Typic Argiaquolls
LOGY (FF)	Torrifluventic Haploxerolls	MAHTOWA (DR)	Typic Haplaquolls
LOKOSEE	Grossarenic Ochraqualfs	MALABAR	Grossarenic Ochraqualfs
LOLAK	Typic Halaquepts	MANAHAWKIN	Terric Medisaprists
LOMALTA	Udorthentic Pellusterts	MANATEE	Typic Argiaquolls
LORAIN (DR)	Mollic Ochraqualfs	MANFRED (DR)	Typic Natraquolls
LOTUS	Aquic Quartzipsamments	MANN (DR)	Typic Haplaquolls
LOUGHBORO	Aeric Glossaqualfs	MANSFIELD	Typic Fragiaquepts
LOUIN	Aquentic Chromuderts	MARCUS	Typic Haplaquolls
LOUP	Typic Haplaquolls	MARCUSE	Vertic Haplaquepts
LOVELAND	Fluvaquentic Haplaquolls	MARCY	Typic Fraqiaquepts
LOVELOCK	Fluvaquentic Haplaquolls	MARENGO	Typic Argiaquolls
LOWS (DR)	Mollic Haplaquepts	MARGATE	Mollic Psammaquents
LOXLEY (DR)	Typic Borosaprists	MARIA (FF)	Typic Haplaquepts
LOYSVILLE	Typic Fragiaqualfs	MARKES	Typic Ochraqualfs
LUDDEN (DR)	Vertic Haplaquolls	MARKEY (DR)	Terric Borosaprists
LUFKIN	Vertic Albaqualfs	MARLA	Aquic Cryumbrepts
LUMBEE (DR)	Typic Ochraquults	MARLAKE	Mollic Fluvaquents
LUMMI	Fluvaquentic Haplaquolls	MARNA	Typic Haplaquolls
LUNCH	Terric Cryohemists	MARSHAN (DR)	Typic Haplaquolls
LUPTON (DR)	Typic Borosaprists	MARSHBROOK	Cumulic Haplaquolls
LURA (DR)	Cumulic Haplaquolls	MARSHDALE	Cumulic Haplaquolls
LURAY	Typic Argiaquolls	MARSHFIELD (DR)	Typic Ochraqualfs
LUTE (P)	Typic Natraquolls	MARTEL	Typic Umbraqualfs
LUTON	Vertic Haplaquolls	MARTIN PENA	Tropic Fluvaquents
LYLES	Typic Haplaquolls	MARTISCO	Histic Humaquepts
LYME (DR)	Aeric Haplaquepts	MARYSLAND (DR)	Typic Calciaquolls
LYNN HAVEN	Typic Haplaquods	MASCOTTE	Ultic Haplaquods
LYNNE	Ultic Haplaquods	MASHULAVILLE	Typic Fragiaquults
LYONS (DR)	Mollic Haplaquepts	MASONTOWN	Cumulic Humaquepts

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
MASSENA	Aeric Haplaquepts	MEIKLE	Typic Albaqualfs
MASSIE	Typic Argialbolls	MELHOMES	Humaqueptic Psammaquents
MATAGORDA	Typic Natraqualfs	MELTON	Humic Cryaquepts
MATHISTON	Aeric Fluvaquents	MELVIN	Typic Fluvaquents
MATTAMUSKEET (DR)	Terric Medisaprists	MENASHA (DR)	Typic Haplaquolls
MATTAN	Terric Medisaprists	MENDELTNA	Histic Pergelic Cryaquepts
MATUNUCK	Typic Sulfaquents	MENDENHALL	Cumulic Cryaquolls
MAUMEE (DR)	Typic Haplaquolls	MENLO	Histic Humaquepts
MAUREPAS	Typic Medisaprists	MERCEDES (F)	Udorthentic Pellusterts
MAURERTOWN	Typic Ochraqualfs	MERDEN	Fluvaquentic Haplaquolls
MAVIE	Typic Calciaquolls	MERMENTAU	Aeric Haplaquepts
MAXCREEK	Typic Haplaquolls	MERMILL (DR)	Mollic Ochraqualfs
MAXFIELD	Typic Haplaquolls	MERWIN (DR)	Terric Borohemists
MAYBESO	Terric Cryosaprists	MESEI	Terric Troposaprists
MAYBID	Typic Humaquepts	MHOON	Typic Fluvaquents
MAYER (DR)	Typic Haplaquolls	MICCO	Terric Medifibrists
MAYHEW	Vertic Ochraqualfs	MIDLAND	Typic Ochraqualfs
MAZASKA	Typic Argiaquolls	MILFORD (DR)	Typic Haplaquolls
MCCLEARY	Aeric Fluvaquents	MILLERVILLE (DR)	Limnic Borohemists
MCCOLL (DR)	Typic Fragiaquults	MILLGROVE	Typic Argiaquolls
MCCRORY	Albic Glossic Natraqualfs	MILLINGTON (DR)	Cumulic Haplaquolls
MCCUNE	Aeric Glossaqualfs	MILLSDALE	Typic Argiaquolls
MCDONALDSVILLE	Typic Haplaquolls	MINER	Mollic Ochraqualfs
MCFAIN (DR)	Fluvaquentic Haplaquolls	MINNETONKA (DR)	Typic Argiaquolls
MCGEHEE	Aeric Ochraqualfs	MINNEWAUKAN	Typic Psammaquents
MCGIRK	Typic Ochraqualfs	MINNIECE	Typic Umbraqualfs
MCGUFFEY	Histic Humaquepts	MINOCQUA (DR)	Mollic Haplaquepts
MCKEE	Typic Hydraquents	MINTER (FF)	Typic Ochraqualfs
MCKENNA	Mollic Haplaquepts	MITCH (F)	Cumulic Haploborolls
MCKENSIE	Typic Haplaquepts	MOAG	Typic Fluvaquents
MCMURRAY	Typic Medihemists	MOLAS	Typic Argialbolls
MEDANO	Typic Haplaquolls	MOLLVILLE	Typic Glossaqualfs
MEDFRA	Histic Pergelic Cryaquepts	MONARDA (DR)	Aeric Fragiaquepts
MEDOMAK	Fluvaquentic Humaquepts	MONEE	Mollic Ochraqualfs
MEGGETT (DR)	Typic Albaqualfs	MONITEAU	Typic Ochraqualfs

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
MONROEVILLE (DR)	Typic Argiaquolls	NACLINA	Aquentic Chromuderts
MONTEOCHA	Ultic Haplaquods	NADA	Typic Albaqualfs
MONTGOMERY (DR)	Typic Haplaquolls	NAHATCHE	Aeric Fluvaquents
MONTVERDE	Typic Medifibrists	NAHMA (DR)	Histic Humaquepts
MOOREVILLE (FF)	Fluvaquentic Dystrochrepts	NAKINA (DR)	Typic Umbraqualfs
MOOSE RIVER	Typic Cryaquents	NAKNEK	Histic Pergelic Cryaquepts
MOOSELAKE (DR)	Typic Borohemists	NANIAK	Typic Sulfaquents
MOOSILAUKE (DR)	Aeric Haplaquepts	NAPA	Typic Natraquolls
MORALES	Aeric Glossaqualfs	NAPOLEON	Typic Medihemists
MORELAND (FF)	Vertic Hapludolls	NARROWS	Calcic Cryaquolls
MOREY	Typic Argiaquolls	NARTA	Typic Natraqualfs
MORPH (DR)	Typic Glossaqualfs	NASKEAG	Aeric Haplaquods
MOSLANDER	Typic Cryaquolls	NASS	Typic Haplaquents
MOULTRIE	Spodic Psammaquents	NATAL	Umbric Ochraqualfs
MOUNDPRAIRIE	Mollic Fluvaquents	NATROY	Aquic Chromoxererts
MOUNTAINVIEW	Fluvaquentic Medisaprists	NAVAJO	Vertic Torrifluvents
MOUNTMED		NAVAN (DR)	Typic Argiaquolls
MOWATA	Typic Glossaqualfs	NAWNEY	Typic Fluvaquents
MOYINA	Andic Cryaquepts	NELSE (FF)	
MUCKALEE	Typic Fluvaquents	NEMAH	Humic Haplaquepts
MUDSOCK	Mollic Haplaquepts	NESS	Udic Pellusterts
MUKILTEO	Typic Medihemists	NETTLES	Alfic Arenic Haplaquods
MULAT	Arenic Ochraquults	NEVERSINK	Aeric Haplaquepts
MULDROW	Typic Argiaquolls	NEWALBIN	Typic Fluvaquents
MULLICA	Typic Humaquepts	NEWARK (P)	Aeric Fluvaquents
MULLINS	Typic Fragiaquults	NEWBERG	Fluventic Haploxerolls
MUNSET	Ultic Haploxeralfs	NEWBERRY	Mollic Ochraqualfs
MURVILLE	Typic Haplaquods	NEWELLTON (FF)	Aeric Fluvaquents
MUSKEGO (DR)	Limnic Medisaprists	NEWSON (DR)	Humaqueptic Psammaquents
MUSSEY (DR)	Typic Argiaquolls	NEWTON (DR)	Typic Humaquepts
MUSTANG	Typic Psammaquents	NGERUNGOR	Typic Sulfihemists
MYAKKA	Aeric Haplaquods	NIKFUL	Aquultic Hapludalfs
MYATT (DR)	Typic Ochraquults	NIKOLAI (DR)	Terric Borosaprists
MYRICK (DR)	Fluvaquentic Haplaquolls	NIMMO (DR)	Typic Ochraquults
NABESNA	Histic Pergelic Cryaquepts	NIOTA	Mollic Albaqualfs

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
NISHNA	Cumulic Haplaquolls	OKOBOJI	Cumulic Haplaquolls
NISHON (DR)	Typic Albaqualfs	OLASHES (FF)	Mollic Haploxeralfs
NITTAW	Typic Argiaquolls	OLBUT	Abruptic Argiaquolls
NOKASIPPI	Typic Haplaquolls	OLDHAM (DR)	Cumulic Haplaquolls
NOLIN (FF)	Dystric Fluventic Eutrochrepts	OLDS	Andic Cryaquepts
NOLO	Typic Fragiaquults	OLDSMAR	Alfic Arenic Haplaquods
NOME	Pergelic Cryaquepts	OLENO	Vertic Haplaquepts
NOOKACHAMPS	Typic Fluvaquents	OLENTANGY (DR)	Histic Humaquepts
NORMA	Mollic Haplaquepts	OLMSTED	Mollic Ochraqualfs
NORTHCOTE (DR)	Vertic Haplaquolls	OLUSTEE	Ultic Haplaquods
NORTHWOOD (DR)	Histic Humaquepts	OMNI	Fluvaquentic Haplaquolls
NORWELL (DR)	Typic Fragiaquepts	ONA	Typic Haplaquods
NORWICH	Typic Fragiaquepts	ONTKO	Andic Cryaquepts
NOTI	Typic Humaquepts	OPELIKA	Mollic Albaqualfs
NOVARY	Cumulic Cryaquolls	OPENLAKE (FF)	Vertic Haplaquepts
NOVATO	Typic Hydraquents	ORCAS	Typic Sphagnofibrists
NUBY	Typic Fluvaquents	ORELIA (P)	Typic Ochraqualfs
NUGENT (FF)	Typic Udifluvents	ORIDIA	Aeric Fluvaquents
NUTALL	Mollic Albaqualfs	ORIO (DR)	Mollic Ochraqualfs
OAKHURST	Vertic Albaqualfs	ORWET (DR)	Typic Calciaquolls
OAKLIMETER (FF)	Fluvaquentic Dystrochrepts	OSAGE	Vertic Haplaquolls
OBANION	Aeric Halaquepts	OSHAWA	Cumulic Haplaquolls
OCHO	Haplic Nadurargids	OSIER (DR)	Typic Psammaquents
OCOEE	Terric Medifibrists	OSSIAN (DR)	Typic Haplaquolls
OCOSTA	Typic Fluvaquents	OSSIPEE (DR)	Terric Borohemists
ODENSON	Andaqueptic Haplaquolls	OSWALD (FF)	Aquic Chromoxererts
ODNE	Typic Ochraqualfs	OTHELLO	Typic Ochraquults
OGEECHEE (DR)	Typic Ochraquults	OTTER (DR)	Cumulic Haplaquolls
OGEMAW (DR)	Aquic Haplorthids	OUACHITA (FF)	Fluventic Dystrochrepts
OJATA	Typic Calciaquolls	OVERTON	Aeric Haplaquepts
OKANOGAN (FF)	Fluventic Haploxerolls	OWEGO	Mollic Fluvaquents
OKAW	Typic Albaqualfs	OZAMIS	Fluvaquentic Haplaquolls
OKEECHOBEE (DR)	Hemic Medisaprists	OZAN	Typic Glossaqualfs
OKEELANTA (DR)	Terric Medisaprists	OZIAS	Aeric Fluvaquents
OKLAWAHA	Terric Medifibrists	PAHOKEE	Lithic Medisaprists

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
PAHRANAGAT	Fluvaquentic Haplaquolls	PELHAM (DR)	Arenic Paleaquults
PAISLEY	Typic Albaqualfs	PELIC	Typic Fluvaquents
PALMAR	Typic Tropohemists	PELLA (DR)	Typic Haplaquolls
PALMETTO	Grossarenic Paleaquults	PELLICER	Typic Sulfaquents
PALMS (DR)	Terric Medisaprists	PEMI (DR)	Typic Haplaquepts
PAMLICO (DR)	Terric Medisaprists	PENGILLY	Typic Fluvaquents
PANASOFFKEE	Arenic Ochraqualfs	PENNSUCO	Typic Fluvaquents
PANDORA	Typic Ochraqualfs	PEOGA	Typic Ochraqualfs
PANGBORN	Typic Medisaprists	PEOH	Cumulic Haplaquolls
PANSEY	Plinthic Paleaquults	PEONE	Andaqueptic Fluvaquents
PANTEGO (DR)	Umbric Paleaquults	PEORIA	Albic Glossic Natraqualfs
PANTHER	Typic Haplaquolls	PEOTONE (DR)	Cumulic Haplaquolls
PAPAGUA	Typic Albaqualfs	PEPPER	Alfic Haplaquods
PARANAT	Fluvaquentic Haplaquolls	PERCILLA	Aeric ochraqualfs
PAREHAT	Fluvaquentic Haploxerolls	PERCY (DR)	Typic Calciaquolls
PARENT (DR)	Typic Haplaquolls	PERELLA (DR)	Typic Haplaquolls
PARKHILL (DR)	Mollic Haplaquepts	PERQUIMANS (DR)	Typic Ochraquults
PARKWOOD	Mollic Ochraqualfs	PERRINE	Typic Fluvaquents
PARNELL (DR)	Typic Argiaquolls	PERRY	Vertic Haplaquepts
PARSIPPANY	Aeric Ochraqualfs	PESCADERO (FF)	Aquic Natrixeralfs
PARTLOW	Typic Ochraquults	PETEETNEET	Typic Medisaprists
PASCO	Cumulic Haplaquolls	PETROLIA (DR)	Typic Fluvaquents
PASQUETTI	Andaqueptic Haplaquolls	PETTIGREW (DR)	Histic Humaquepts
PASQUOTANK (DR)	Typic Haplaquepts	PEWAMO (DR)	Typic Argiaquolls
PATCHIN	Aeric Haplaquepts	PHILBON	Terric Medisaprists
PATTERSON	Aeric Ochraqualfs	PHOENIX	Entic Pelloxererts
PATTON (DR)	Typic Haplaquolls	PIASA	Mollic Natraqualfs
PAULDING	Typic Haplaquepts	PICKFORD	Aeric Haplaquepts
PAULINA	Fluvaquentic Haplaquolls	PICKNEY (DR)	Cumulic Humaquepts
PAWCATUCK	Typic Sulfihemists	PILINE	Aquic Chromoxererts
PAXICO	Aeric Fluvaquents	PILLSBURY (DR)	Aeric Haplaquepts
PAXVILLE (DR)	Typic Umbraquults	PINCONNING (DR)	Mollic Haplaquents
PEACHAM (DR)	Humic Fragiaquepts	PINEDA	Arenic Glossaqualfs
PECKISH	Typic Sulfaquents	PINELLAS	Arenic Ochraqualfs
PEDIGO (FF)	Cumulic Haploxerolls	PINHOOK (DR)	Mollic Ochraqualfs

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
PINNEBOG (DR)	Hemic Medisaprists	POUNCEY	Typic Albaquults
PINONES	Thapto-Histic Tropic Fluvaquents	POVERTY	Typic Haplaquepts
PIOPOLIS (DR)	Typic Fluvaquents	POY (DR)	Typic Haplaquolls
PIT (FF)	Chromic Pelloxererts	POYGAN (DR)	Typic Haplaquolls
PLACEDO	Typic Fluvaquents	PREAKNESS	Typic Humaquepts
PLACID	Typic Humaquepts	PREBISH (DR)	Typic Haplaquolls
PLANK	Typic Glossaqualfs	PROCHASKA (DR)	Fluvaquentic Haplaquolls
PLANKINTON (DR)	Typic Argialbolls	PROVO BAY	Typic Calciaquolls
PLANTATION	Histic Humaquepts	PUERCO	Typic Torrerts
PLATTE	Mollic Fluvaquents	PUGET	Aeric Fluvaquents
PLAYMOOR	Cumulic Haplaquolls	PUNGO (DR)	Typic Medisaprists
PLEASANT (P)	Torrertic Argiustolls	PUNTA	Grossarenic Haplaquods
PLEINE	Histic Humaquepts	PURDY	Typic Ochraquults
PLEVNA	Fluvaquentic Haplaquolls	PUSHMATAHA	Aquic Udifluvents
PLUCK	Typic Fluvaquents	PUTNAM	Mollic Albaqualfs
PLUMMER (DR)	Grossarenic Paleaquults	PYBURN	Typic Umbraquults
POCATY	Typic Sulfihemists	PYWELL	Typic Borosaprists
POCOMOKE	Typic Umbraquults	QUAM (DR)	Cumulic Haplaquolls
POGANEAB	Typic Fluvaquents	QUARLES	Mollic Ochraqualfs
POLAWANA (DR)	Cumulic Humaquepts	QUINN	Typic Ochraqualfs
POMONA	Ultic Haplaquods	QUOSATANA	Fluvaquentic Humaquepts
POMPANO	Typic Psammaquents	RACOMBES	Pachic Argiustolls
PONZER (DR)	Terric Medisaprists	RACOON (DR)	Typic Ochraqualfs
POOLER (DR)	Typic Ochraquults	RAFAEL	Typic Haplaquepts
POPASH	Typic Umbraqualfs	RAFTON	Typic Fluvaquents
POPHERS	Aeric Fluvaquents	RAGSDALE (DR)	Typic Argiaquolls
POPLE	Arenic Glossaqualfs	RAHAL	Arenic Albaqualfs
PORFIRIO	Aquic Calciustolls	RAINS	Typic Paleaquults
PORRETT	Andaqueptic Ochraqualfs	RALSEN	Fluvaquentic Haplaquolls
PORTAGE	Vertic Haplaquolls	RAMELLI (FF)	Typic Haplaquolls
PORTAGEVILLE (DR)	Vertic Haplaquolls	RAMSDELL	Typic Haplaquepts
PORTLAND	Vertic Haplaquepts	RANDALL (DR)	Udic Pellusterts
PORTSMOUTH (DR)	Typic Umbraquults	RANDMAN	Argic Cryaquolls
POTTSBURG	Grossarenic Haplaquods	RANTOUL (DR)	Vertic Haplaquolls
POUJADE	Durixerollic Haplargids	RAPPAHANNOCK	Terric Sulfihemists

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
RAUVILLE	Cumulic Haplaquolls	ROANOKE (DR)	Typic Ochraquults
RAVENDALE	Entic Chromoxererts	ROBERTSVILLE	Typic Fragiaqualfs
RAYLAKE	Aquentic Chromuderts	ROBINSONVILLE (FF)	Typic Udifluvents
RAYNHAM (DR)	Aeric Haplaquepts	ROCKWELL	Typic Calciaquolls
RAYPOL	Aeric Haplaquepts	ROEBUCK (FF)	Vertic Hapludolls
REDCO	Aquentic Chromuderts	ROELLEN	Vertic Haplaquolls
REDDICK (DR)	Typic Haplaquolls	ROEMER	Arenic Ochraqualfs
REDLODGE	Cumulic Cryaquolls	ROETEX	Udertic Haplustolls
REED	Vertic Argiaquolls	ROLFE	Typic Argialbolls
REESVILLE	Aeric Ochraqualfs	ROLISS (DR)	Typic Haplaquolls
REGAL	Typic Haplaquolls	ROMEO	Lithic Haplaquolls
REGAN (DR)	Typic Calciaquolls	ROMNELL	Cumulic Haplaquolls
REMBERT (DR)	Typic Ochraquults	ROMULUS	Udollic Ochraqualfs
RENNIE	Mollic Fluvaquents	RONDEAU (DR)	Limnic Borosaprists
RENSSELAER (DR)	Typic Argiaquolls	ROOT	Mollic Fluvaquents
RENTON	Mollic Fluvaquents	ROPER (DR)	Histic Humaquepts
REPARADA	Tropic Fluvaquents	ROSANE	Typic Cryaquolls
RETROP	Aquic Udifluvents	ROSCOE	Typic Pellusterts
REVERE	Typic Calciaquolls	ROSCOMMON (DR)	Mollic Psammaquents
REXFORD	Aeric Fragiaquepts	ROSE CREEK	Fluvaquentic Haploxerolls
REYES (F)	Sulfic Fluvaquents	ROSEBLOOM	Typic Fluvaquents
RIB (DR)	Mollic Haplaquepts	ROSEDHU (DR)	Typic Haplaquods
RICCO	Fluvaquentic Haplaquolls	ROSELLA	Albic Glossic Natraqualfs
RICEBORO (DR)	Arenic Paleaquults	ROSEWOOD (DR)	Typic Calciaquolls
RIDOTT	Mollic Ochraqualfs	ROSHE SPRINGS	Typic Calciaquolls
RIFLE (DR)	Typic Borohemists	ROUNDABOUT (DR)	Aeric Haplaquepts
RIGOLETTE	Typic Ochraqualfs	ROUNDHEAD (DR)	Histic Humaquepts
RINDGE	Typic Medisaprists	ROUTON	Typic Ochraqualfs
RIO	Typic Argiaquolls	ROWE	Typic Argiaquolls
RIPPOWAM (DR)	Aeric Fluvaquents	ROXANA (FF)	Typic Udifluents
RITA	Typic Fluvaquents	ROXTON	Vertic Haplaquolls
RITZ	Typic Fluvaquents	RUARK	Typic Ochraqualfs
RIVIERA	Arenic Glossaqualfs	RUBIO	Mollic Albaqualfs
RIVRA (FF)	Ustic Torrifluvents	RUMNEY	Aeric Fluvaquents
RIZ	Typic Natrixeralfs	RUNEBERG (DR)	Typic Haplaquolls

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
RUSCO (P)	Aquic Argiustolls	SARPY	Typic Udipsamments
RUSE	Lithic Haplaquepts	SATILLA	Thapto-Histic Fluvaquents
RUSHMORE (DR)	Typic Haplaquolls	SAUCEL	Typic Salorthids
RUSHVILLE	Typic Albaqualfs	SAUGATUCK (DR)	Aeric Haplaquods
RUTLEGE (DR)	Typic Humaquepts	SAULICH	Histic Pergelic Cryaquepts
RYAN	Typic Natraquolls	SAUNDERS	Aeric Calciaquolls
SABLE (DR)	Typic Haplaquolls	SAUVIE	Fluvaquentic Haplaquolls
SACO	Fluvaquentic Haplaquolls	SAWATCH	Histic Haplaquolls
SACRAMENTO (FF)	Vertic Haplaquolls	SAWMILL (DR)	Cumulic Haplaquolls
SAGANING (DR)	Aeric Haplaquepts	SAWTELPEAK	Typic Cryaquolls
SAGE	Typic Fluvaquents	SAYERS (FF)	Typic Ustifluvents
SAGO (DR)	Histic Humaquepts	SCANTIC (DR)	Typic Haplaquepts
SALADAR	Fluvaquentic Troposaprists	SCARBORO	Histic Humaquepts
SALADON	Typic Cryaquolls	SCATLAKE	Typic Hydraquents
SALAMATOF	Spagnic Borofibrists	SCHERRARD	Natric Duraquolls
SALERNO	Grossarenic Haplaquods	SCHOOLEY	Andaqueptic Fluvaquents
SALINAS (FF)	Pachic Haploxerolls	SCHRADER	Cumulic Haplaquolls
SALMO	Cumulic Haplaquolls	SCITICO	Typic Haplaquepts
SALT LAKE	Typic Calciaquolls	SCOGGIN	Typic Ochraquults
SALTAIR	Typic Salorthids	SCOTT (DR)	Typic Argialbolls
SALTERY	Fluvaquentic Cryofibrists	SCUPPERNONG (DR)	Terric Medisaprists
SALTESE	Typic Medisaprists	SEARSPORT	Typic Psammaquents
SALZER	Vertic Haplaquepts	SEASTRAND	Terric Medihemists
SAMBA	Typic Umbraqualfs	SEATTLE	Typic Medihemists
SAMISH	Typic Fluvaquents	SEBAGO	Fibric Borohemists
SAMMAMISH	Fluvaquentic Humaquepts	SEBEWA (DR)	Typic Argiaquolls
SAMPSEL	Typic Argiaquolls	SEBRING	Typic Ochraqualfs
SAMSULA (DR)	Terric Medisaprists	SEELYEVILLE (DR)	Typic Borosaprists
SANDUSKY	Fluvaquentic Haplaquolls	SEGIDAL	Typic Sideraquods
SANIBEL (DR)	Typic Psammaquents	SEJITA	Typic Salorthids
SANTANELA	Typic Natraqualfs	SEKIU	Humic Haplaquepts
SANTAROSA (F)	Typic Haplaquolls	SELLERS	Cumulic Humaquepts
SANTEE (DR)	Typic Argiaquolls	SELMA (DR)	Typic Haplaquolls
SAPELO	Ultic Haplaquods	SEMIAHMOO	Typic Medisaprists
SARANAC (DR)	Fluvaquentic Haplaquolls	SESSUM	Vertic Ochraqualfs

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
SETTLEMENT	Aeric Halaquepts	SNIDER	Aquic Hapludolls
SETTLEMEYER	Fluvaquentic Haplaquolls	SNOHOMISH	Thapto-Histic Fluvaquents
SEVERN (FF)	Typic Udifluvents	SOLIER	Aeric Haplaquepts
SEXTON	Typic Ochraqualfs	SOLOMON	Vertic Haplaquolls
SHAKER	Aeric Haplaquepts	SONOMA	Aeric Fluvaquents
SHAKOPEE	Typic Calciaquolls	SORTER	Typic Ochraqualfs
SHALBA	Typic Albaqualfs	SOSTIEN	Vertic Fluvaquents
SHALCAR	Terric Medisaprists	SOUTHAM	Cumulic Haplaquolls
SHANDEP (DR)	Cumulic Haplaquolls	SPALDING	Typic Borohemists
SHANGHAI (FF)	Aquic Xerofluvents	SPENARD (DR)	Sideric Cryaquods
SHARKEY	Vertic Haplaquepts	SPERRY	Typic Argialbolls
SHEFFIELD	Typic Fragiaqualfs	SPICER (DR)	Typic Haplaquolls
SHELMADINE	Typic Fragiaquults	SPOONER (DR)	Typic Ochraqualfs
SHENKS	Terric Medisaprists	SPRINGFIELD	Aeric Albaqualfs
SHERRY (DR)	Udollic Ochraqualfs	ST. JOHNS	Typic Haplaquods
SHILOH (DR)	Cumulic Haplaquolls	ST. NICHOLAS	Lithic Cryaquods
SHIMA	Terric Medisaprists	STAMP	Typic Cryochrepts
SHINKEE	Terric Medisaprists	STANEY	Fluvaquentic Cryofibrists
SHONKIN	Typic Haplustalfs	STAPLES	Arenic Ochraqualfs
SHOOKER (DR)	Typic Ochraqualfs	STARICHKOF	Fluvaquentic Borohemists
SHREWSBURY (DR)	Typic Ochraquults	STATELINE	Mollic Ochraqualfs
SHUMWAY	Vertic Haplaquepts	STAVE	Typic Cryaquents
SICKLES (DR)	Mollic Haplaquents	STEED	Entic Haploxerolls
SIKESTON	Cumulic Haplaquolls	STENDAL	Aeric Fluvaquents
SILVIES	Cumulic Cryaquolls	STERRETT	Aeric Ochraqualfs
SIMS (DR)	Mollic Haplaquepts	STIMSON	Typic Humaquepts
SKAGIT	Typic Fluvaquents	STIRUM (DR)	Typic Natraquolls
SKAGWAY	Typic Cryopsamments	STOCKADE	Typic Umbraqualfs
SKOKOMISH	Mollic Fluvaquents	STONO (DR)	Typic Argiaquolls
SLIKOK	Histic Cryaquepts	STRANDQUIST	Typic Haplaquolls
SLOAN	Fluvaquentic Haplaquolls	STREATOR (DR)	Typic Haplaquolls
SMILEY (DR)	Typic Argiaquolls	STROM	Pachic Argixerolls
SMILEYVILLE	Mollic Albaqualfs	STUMPP	Natric Cryoborolls
SMITHTON	Typic Paleaquults	STURGILL	Fluvaquentic Haplaquolls
SMYRNA	Aeric Haplaquods	SUCARNOOCHEE (FF)	Aquentic Chromuderts

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
SUISUN	Typic Medihemists	TAWCAW (FF)	Fluvaquentic Dystrochrepts
SUMAN (DR)	Fluvaquentic Haplaquolls	TEALWHIT	Aeric Haplaquepts
SUMAS	Typic Fluvaquents	TEETERS	Mollic Halaquepts
SUMPF (DR)	Cumulic Haplaquolls	TELA (FF)	Typic Argiustolls
SUN	Aeric Haplaquepts	TELFERNER	Typic Albaqualfs
SUNNYHAY	Lithic Cryosaprists	TEMPLE (FF)	Aeric Haplaquepts
SURFSIDE	Vertic Haplaquolls	TENDOY	Typic Borosaprists
SURRENCY	Arenic Umbric Paleaquults	TENSAS (FF)	Aeric Ochraqualfs
SUSANNA	Ultic Haplaquods	TEPETE	Terric Borohemists
SWALER	Xerollic Paleargids	TEQUESTA	Arenic Glossaqualfs
SWAN	Typic Haplaquolls	TERMO	Xerollic Paleargids
SWANSEA	Terric Medisaprists	TEROUGE	Aquic Chromuderts
SWANTON (DR)	Aeric Haplaquepts	TERRA CEIA (DR)	Typic Medisaprists
SWANVILLE (DR)	Aeric Haplaquepts	TETONKA (DR)	Argiaquic Argialbolls
SWARTZ	Typic Palexeralfs	TETONVIEW (DR)	Typic Calciaquolls
SWEETWATER	Fluvaquentic Haplaquolls	TETONVILLE	Mollic Cryofluvents
SYCAMORE (FF)	Aeric Haplaquepts	TEXARK	Typic Pelluderts
SYRENE	Typic Calciaquolls	THIEFRIVER (DR)	Typic Calciaquolls
TACOMA	Andaqueptic Fluvaquents	THOMAS (DR)	Histic Humaquepts
TACOOSH (DR)	Terric Borohemists	THORNDALE	Typic Fragiaqualfs
TAINTOR	Typic Argiaquolls	THORNTON	Aquic Xerorthents
TALCO	Aeric Glossaqualfs	THORP (DR)	Argiaquic Argialbolls
TALCOT (DR)	Typic Haplaquolls	TIBURONES	Typic Troposaprists
TALMOON (DR)	Mollic Ochraqualfs	TICE (FF)	Fluvaquentic Hapludolls
TALQUIN	Entic Haplaquods	TICHNOR	Typic Ochraqualfs
TAMBA	Typic Haplaquepts	TIFFANY (DR)	Typic Haplaquolls
TANAK		TILFER	Typic Haplaquolls
TANANA	Pergelic Cryaquepts	TIMBALIER	Typic Medisaprists
TANDY	Aquic Udifluvents	TINN	Vertic Haplaquolls
TANTILE	Ultic Haplaquods	TIOCANO (DR)	Udic Pellusterts
TANWAX	Mollic Fluvaquents	TISCH	Mollic Andaquepts
TAPPAN (DR)	Typic Haplaquolls	TISONIA	Typic Sulfihemists
TATLUM	Typic Hydraquents	TITUS	Fluvaquentic Haplaquolls
TATTON	Typic Psammaquents	TOBICO (DR)	Mollic Psammaquents
TAWAS (DR)	Terric Borosaprists	TOCOI	Ultic Haplaquods

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
TODDSTAV	Typic Ochraquults	TUCKER (FF)	Cumulic Haploxerolls
TOGUS	Terric Borofibrists	TUCKERMAN	Typic Ochraqualfs
TOINE (FF)	Ultic Hapludalfs	TUGHILL	Histic Humaquepts
TOISNOT (DR)	Typic Fragiaquults	TUKWILA	Limnic Medisaprists
TOLEDO	Mollic Haplaquepts	TULELAKE (F)	Aeric Fluvaquents
TOLSONA	Histic Pergelic Cryaquepts	TULLAHASSEE (FF)	Aquic Udifluvents
TOMAST	Aeric Paleaquults	TUNICA (FF)	Vertic Haplaquepts
TOMOKA	Terric Medisaprists	TUPUKNUK	Pergelic Cryaquepts
TOMOTLEY (DR)	Typic Ochraquults	TURLOCK	Albic Natraqualfs
TONKA (DR)	Argiaquic Argialbolls	TURNBULL	Typic Hydraquents
TONKEY (DR)	Mollic Haplaquepts	TUSCAWILLA	Typic Ochraqualfs
TOOLES	Arenic Albaqualfs	TUSCUMBIA	Vertic Haplaquepts
TOOLESBORO	Typic Haplaquolls	TUSKEEGO	Mollic Ochraqualfs
TOPPENISH	Fluvaquentic Haplaquolls	TWEBA	Aeric Fluvaquents
TOR	Lithic Haplaquepts	TWIG (DR)	Histic Humaquepts
TORHUNTA (DR)	Typic Humaquepts	TWOMILE	Typic Albaqualfs
TORPEDO LAKE	Histic Cryaquepts	TYNDALL (FF)	Aeric Haplaquepts
TORRY	Typic Medisaprists	TYONEK	Fluvaquentic Borosaprists
TORSIDO	Typic Argiaquolls	UDOLPHO (DR)	Mollic Ochraqualfs
TOTO (DR)	Limnic Medisaprists	UGAK	Andic Cryaquepts
TOTTEN (DR)	Typic Natraquolls	UMBERLAND (F,P)	Aeric Halaquepts
TOWHEE	Typic Fragiaqualfs	UMIAT	Pergelic Cryaquepts
TOXAWAY (DR)	Cumulic Humaquepts	UNA	Typic Haplaquepts
TRACK	Fluvaquentic Haplaquolls	UNAKWIK	Terric Cryohemists
TRACOSA	Typic Haplaquents	UNCAS	Mollic Andaquepts
TRAER	Typic Ochraqualfs	URBO (FF)	Aeric Haplaquepts
TREATY (DR)	Typic Argiaquolls	URICH	Typic Argiaquolls
TREBLOC	Typic Paleaquults	URNESS (DR)	Mollic Fluvaquents
TRIANGLE	Aquic Chromoxererts	UTABA	Cumulic Haploxerolls
TRINITY	Typic Pelluderts	UTE	Argic Cryaquolls
TROSKY (DR)	Typic Haplaquolls	VACHERIE (FF)	Aeric Fluvaquents
TRUMBULL	Typic Ochraqualfs	VALDEZ (FF)	Aeric Haplaquepts
TRUSSEL	Aeric Fragiaquepts	VALKARIA	Spodic Psammaquents
TRYON	Typic Psammaquents	VALLERS (DR)	Typic Calciaquolls
TSIRKU	Typic Cryofluvents	VAMONT	Aquentic Chromuderts

(Continued)

Table DI (Continued)

Soil Phase	Classification	Soil Phase	Classification
VARICK	Mollic Ochraqualfs	WADMALAW (DR)	Umbric Ochraqualfs
VASSALBORO	Typic Borofibrists	WAGNER (DR)	Mollic Albaqualfs
VASTINE	Typic Haplaquolls	WAKELAND (FF)	Aeric Fluvaquents
VAUGHAN	Typic Albaqualfs	WALDEN (FF)	Typic Cryaquolls
VEAZIE	Cumulic Haploxerolls	WALDO	Fluvaquentic Haplaquolls
VEEDUM (DR)	Typic Humaquepts	WALDORF	Typic Haplaquolls
VELASCO	Cumulic Haplaquolls	WALFORD	Mollic Ochraqualfs
VENABLE	Cumulic Cryaquolls	WALLER	Typic Glossaqualfs
VENAPASS	Cumulic Cryaquolls	WALLKILL (DR)	Thapto Histic Fluvaquents
VENICE	Typic Medihemists	WALPOLE	Aeric Haplaquepts
VENLO (DR)	Typic Haplaquolls	WAMBA	Typic Haplaquolls
VERBOORT	Typic Argialbolls	WANSER	Typic Psammaquents
VERENDRYE	Typic Haplaquolls	WAPATO	Fluvaquentic Haplaquolls
VERHALEN	Mollic Torrerts	WARDELL (DR)	Mollic Ochraqualfs
VERO	Alfic Haplaquods	WAREHAM	Humaqueptic Psammaquents
VESPER (DR)	Humic Haplaquepts	WARM SPRINGS	Aeric Calciaquolls
VESTABURG (DR)	Mollic Psammaquents	WARMAN (DR)	Histic Humaquepts
VESTON	Typic Fluvaquents	WARNERS (DR)	Fluvaquentic Haplaquolls
VICTORIA (P)	Udic Pellusterts	WARRENTON	Typic Tropaquepts
VIDAURI	Vertic Albaqualfs	WASDA (DR)	Histic Humaquepts
VIGIA	Histic Tropaquepts	WASHBURN (P)	
VIKING	Typic Haplaquolls	WASHTENAW (DR)	Aeric Fluvaquents
VILLY	Typic Fluvaquents	WASILLA	Humic Cryaquepts
VIMVILLE	Typic Glossaqualfs	WASKISH	Typic Sphagnofibrists
VINCENNES	Typic Haplaquepts	WATCHUNG	Typic Ochraqualfs
VIRDEN (DR)	Typic Argiaquolls	WAUBERG	Arenic Albaqualfs
VOATS (FF)	Fluventic Haploxerolls	WAUCEDAH	Histic Humaquepts
VOLTA	Typic Natraqualfs	WAUCHULA	Ultic Haplaquods
VOLTAIRE	Fluvaquentic Haplaquolls	WAUPACA (DR)	Mollic Fluvaquents
WABASH	Vertic Haplaquolls	WAUSEON (DR)	Typic Haplaquolls
WABASHA	Mollic Fluvaquents	WAUTOMA (DR)	Mollic Haplaquents
WABASSO	Alfic Haplaquods	WAVELAND	Arenic Haplaquods
WACAHOOTA	Arenic Paleaquults	WAVERLY	Typic Fluvaquents
WACOUSTA (DR)	Typic Haplaquolls	WAXPOOL	Albaquic Hapludalfs
WADLEIGH	Typic Cryaquods	WAYLAND (DR)	Mollic Fluvaquents

(Continued)

Table D1 (Continued)

Soil Phase	Classification	Soil Phase	Classification
WEBILE	Terric Medisaprists	WILLETTE (DR)	Terric Medisaprists
WEBSTER	Typic Haplaquolls	WILLIMAN	Arenic Ochraquults
WEEKIWACHEE	Typic Sulfihemists	WILLOWS	Typic Pelloxererts
WEEKSVILLE (DR)	Typic Humaquepts	WILLWOOD	Typic Torriorthents
WEHADKEE (DR)	Typic Fluvaquents	WILMINGTON	Typic Haplaquods
WEIMER	Typic Pelloxererts	WILSON	Vertic Ochraqualfs
WEIR (DR)	Typic Ochraqualfs	WINDER	Typic Glossaqualfs
WEIRMAN (FF)	Torrifluventic Haploxerolls	WINGER	Typic Calciaquolls
WELCH	Cumulic Haplaquolls	WINGINAW (DR)	Terric Borofibrists
WELSUM	Cumulic Haplaquolls	WINLO	Typic Duraquolls
WENAS	Cumulic Haplaquolls	WINTERSET	Typic Argiaquolls
WENDANE	Aeric Halaquepts	WISNER (DR)	Typic Haplaquolls
WESCONNETT	Typic Haplaquods	WITBECK	Mollic Haplaquepts
WESTBROOK	Typic Sulfihemists	WOCKLEY	Plinthaquic Paleudalfs
WESTLAND (DR)	Typic Argiaquolls	WOLCOTT	Typic Haplaquolls
WESTON	Typic Ochraquults	WOLDALE	Typic Haplaquolls
WESTWEGO	Thapto-Histic Fluvaquents	WOLFESON	Aquic Xerochrepts
WETZEL	Typic Ochraqualfs	WOLLENT	Typic Humaquepts
WEYERS	Fluvaquentic Haplaquolls	WOODINGTON (DR)	Typic Paleaquults
WHATELY	Mollic Haplaquepts	WOODINVILLE	Typic Fluvaquents
WHEATLEY (DR)	Mollic Psammaquents	WOODLYN	Typic Ochraqualfs
WHITEHORN	Typic Humaquepts	WOODS CROSS	Cumulic Haplaquolls
WHITESON	Fluvaquentic Haplaquolls	WOOFUS	Fluvaquentic Haplaquolls
WHITEWOOD (DR)	Cumulic Haplaquolls	WORSHAM	Typic Ochraquults
WHITMAN	Typic Humaquepts	WORTHING (DR)	Typic Argiaquolls
WHITSON	Typic Ochraqualfs	WRANGELL	Pergelic Cryohemists
WICHUP (FF)	Histic Cryaquolls	WRENCOE	Typic Haplaquolls
WIERGATE	Typic Pelluderts	WRIGHTSVILLE	Typic Glossaqualfs
WILBANKS (DR)	Cumulic Humaquepts	WULFERT	Terric Sulfihemists
WILBRAHAM	Aquic Dystrochrepts	WYALUSING	Typic Fluvaquents
WILDWOOD (DR)	Histic Humaquepts	WYANDOTTE (DR)	Typic Calciaquolls
WILHITE	Typic Fluvaquents	WYARD	Typic Haplaquolls
WILL (DR)	Typic Haplaquolls	WYICK	Typic Albaqualfs
WILLAMAR	Typic Natraqualfs	WYNONA	Cumulic Haplaquolls
WILLANCH	Aeric Tropaquepts	WYNOOSE	Typic Albaqualfs

(Continued)

Table D1 (Concluded)

Soil Phase	Classification	Soil Phase	Classification
WYSOCKING (DR)	Thapto-Histic Fluvaquents	ZADOG (DR)	Typic Haplaquolls
XIPE	Fluvaquentic Haplaquolls	ZEPHYR	Typic Ochraquults
YAKIMA	Cumulic Haploxerolls	ZIEGENFUSS (DR)	Mollic Haplaquepts
YAMSAY	Limnic Borosaprists	ZILABOY	Aquic Chromuderts
YAQUINA	Aquic Haplorthids	ZILLAH	Fluvaquentic Haplaquolls
YOBE	Aeric Halaquepts	ZIPP	Typic Halaquepts
YONGES (DR)	Typic Ochraqualfs	ZOE	Cumulic Haplaquolls
YORKTOWN	Typic Fluvaquents	ZOHNER	Calcic Cryaquolls
YOST	Typic Pelloxererts	ZOLA (FF)	Cumulic Haploxerolls
YUKON	Histic Pergelic Cryaquepts	ZOOK	Cumulic Haplaquolls
YULEE	Typic Haplaquolls	ZUMAN	Typic Haplaquents
YUVAS	Abruptic Durixeralfs	ZWINGLE	Typic Albaqualfs
ZACHARY	Typic Albaqualfs	ZYZZUG	Typic Humaquepts

(Sheet 27 of 27)

Wakeley
3/93

PLANT SPECIES RECORDED ON MOBILE FIELD SITES

Rabbit Creek Floodplain

Sweetbay	*Magnolia virginiana*	FACW+
Swamp tupelo	*Nyssa sylvatica var. biflora*	OBL
Red maple	*Acer rubrum*	FAC
Red bay	*Persea borbonia*	FACW
Swamp azalea	*Rhododendron viscosum*	FACW+
Hoary azalea	*Rhododendron canescens*	FACW−
Wax myrtle	*Myrica cerifera*	FAC
Evergreen bayberry	*Myrica heterophylla*	FACW
Chinese privet	*Ligustrum sinense*	FAC
Fetterbush	*Lyonia lucida*	FACW
Titi	*Cyrilla racemiflora*	FACW
Bay-gall holly	*Ilex coriacea*	FACW
Possum-haw viburnum	*Viburnum nudum*	FACW+
Virginia willow	*Itea virginica*	FACW+
Blackberry	*Rubus betulifolius*	FAC
Royal fern	*Osmunda regalis*	OBL
Marsh fern	? *Thelypteris palustris*	FACW
Netted chain fern	*Woodwardia areolata*	OBL
Virginia chain fern	*Woodwardia virginica*	OBL
Japanese climbing fern	*Lygodium japonicum*	FAC
Arrow arum	*Peltandra virginica*	OBL
Crossvine	*Bignonia capreolata*	FAC
Laurel-leaf greenbrier	*Smilax laurifolia*	FACW+
Poison ivy	*Toxicodendron radicans*	FAC

Live Oak Landing

Baldcypress	*Taxodium distichum*	OBL
Swamp tupelo	*Nyssa sylvatica var. biflora*	OBL
Sweetgum	*Liquidambar styraciflua*	FAC+
Water locust	*Gleditsia aquatica*	OBL
Diamond-leaf oak	*Quercus hemisphaerica*	
Water oak	*Quercus nigra*	FAC
Red maple	*Acer rubrum*	FAC
American hornbeam	*Carpinus caroliniana*	FAC

"Zeringue, Furcy J MVN"
<Furcy.J.Zeringue@usace.army.mil>
01/29/2008 11:30 AM

To Donna Mullins/R6/USEPA/US@EPA
cc "Herman, John M MVN" <John.M.Herman@usace.army.mil>
bcc
Subject Lafourche Parish Violation # 3

History: This message has been forwarded.

Date: Discovered on 11 Oct. 2007 by John Herman during site visit for processing of permit application.

Location: Project located in Sections 11, 12, 13, 14, and 15, Township 16 South, Range 19 East, Lafourche Parish, Louisiana

The violation is located in Section 11 and 12 at this time.
Quad: 1:24000 USGS topo Lockport, La.

Extent: mechanized landclearing - Average width of approximately 25 feet, length of approximately 4000 feet = approx 2.3-acres cleared

spoil deposition - width of approximately 15 feet, length of approximately 600 feet = approximately 0.21-acre deposited on

Water body: Mathews Canal, a tidal water flowing into Company Canal, also tidal, which flows into Bayou Lafourche also tidal at this location.

PENGAD-Bayonne, N. J.
GOVERNMENT
EXHIBIT
31

Louisiana Department of Natural Resources
Coastal Management Division
(CMD)

Joint Permit Application

For Work Within the Louisiana Coastal Zone

U.S. Army Corps Of Engineers
(COE)
New Orleans District

Print Application

Permit Number: P20071009 Date Received: 07/16/2007

Step 1 of 15 - Applicant Information

Applicant/Company Name: Lafourche Parish Council ***Applicant Type:*** GOVERNMENT AGENCY

Mailing Address: P.O Drawer 5528
Thibodaux, LA 70302

Contact Information: Ray Cheramie

Daytime: 985 537 7603 ***Fax:*** ***Contact Email:***

Step 2 of 15 - Agent Information

Agent/Company Name: J. Wayne Plaisance, INC.

Mailing Address: P.O. Drawer 730
Galliano, LA 70345

Contact Information: Andre Uzee

Daytime: 985 632 5596 ***Fax:*** 985 632 5628 ***Contact Email:*** auzee@jwayneplaisance.com

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Step 3 of 15 - Permit Type

☒ **Coastal Use Permit (CUP)** ☐ **Solicitation of Views (SOV)** ☐ **Request for Determination (RFD)**

Step 4 of 15 - Pre-Application Activity

a. ***Have you participated in a Pre-Application or Geological Review Meeting for the proposed project?***

☒ **No** ☐ **Yes** **Date meeting was held:**

PENGAD-Bayonne, N.J.
GOVERNMENT EXHIBIT
32

Attendees:

(Individual or Company Rep) (CMD Representative) (COE Representative)

b. Have you obtained an official wetland determination from the COE for the project site?

☒ No ☐ Yes

c. Is this application a mitigation plan for another CUP?

☒ No ☐ Yes **Permit Number:**

Step 5 of 15 - Project Information

a. Describe the project:

Clear the Mathews Canal in order to improve drainage in Mathews

b. Is this application a change to an existing permit?

☒ No ☐ Yes **Permit Number:**

c. Have you previously applied for a permit or emergency authorization for all or any part of the proposed project?

☒ No ☐ Yes

Agency Name	Permit Number	Decision Status	Decision Date
CMD			
COE			
Other			

Step 6 of 15 - Project Location

a. Physical Location

Street:

City: Mathews **Parish:** LAFOURCHE **Zip:** 70375

b. Latitude and Longitude

Latitude: 29 31 41 **Longitude:** -90 40 52

c. *Section, Township, and Range*

Section #:	11-15	**Township #:**	16S	**Range #:**	19E
Section #:		**Township #:**		**Range #:**	

d. *Lot, Track, Parcel, or Subdivision Name*

Lot #:		**Parcel #:**	
Tract #:		**Subdivision Name:**	

e. *Site Direction:*

Start intersection of HWY 90 and La. 308 turn South on La. 308 and travel approx. 3 miles to the intersection of La. 308 and La. 654 (Gheens Road) turn East on La. 654 and travel approx. 3/4 of a mile. The canal starts on the right side of the road

---

Step 7 of 15 - Adjacent Landowners

Adjacent Landowner 1: John Brady

Mailing Address:
363 Industrial Park Rd
Lockport, , LA 70374

Adjacent Landowner 2: Raceland Raw Sugars

Mailing Address:
159 Milli Street
Raceland, , LA 70394

Adjacent Landowner 3: John Barker

Mailing Address:
122 Barker Rd
Lockport, , LA 70374

Adjacent Landowner 4: Benny Cenac

Mailing Address:
3326 Gheens Main Rd
Gheens, , LA 70355

Step 8 of 15 - Project Specifics

a. ***Project Name and/or Title:*** Clearing of the Mathews Canal

b. ***Project Type:*** Non-Residential

c. ***What will be done for the proposed project?***

☐ **Bridge/Road** ☐ **Home Site/Driveway** ☐ **Pipeline/Flow Line** ☐ **Rip Rap/Erosion Control**

☐ **Bulkhead/Fill** ☒ **Levee Construction** ☐ **Plug/Abandon** ☐ **Site Clearance**

☐ Drainage Improvements ☒ Maintenance Dredging ☐ Production Barge/Structure ☐ Subdivision

☐ Drill Barge/Structure ☐ Prop Washing ☐ Vegetative Plantings ☐ Wharf/Pier/Boathouse

☐ Drill Site ☐ Pilings ☐ Remove Structures

☐ Other:

d. Why is the proposed project needed?

to provide improved drainage

Step 9 of 15 - Project Status

a. Proposed project start date: 06/01/2007 *Proposed project completion date:* 09/30/2007

b. Is any of the project work in progress?

☒ No ☐ Yes

c. Is any of the project work complete?

☒ No ☐ Yes

Step 10 of 15 - Structures, Materials, and Methods for the Proposed Project

a. Excavations

☐ Vegetated Waterbottoms:	yd^3	Acres	☐ Wetlands:	yd^3	Acres
☐ Non-Vegetated Waterbottoms:	20,000 yd^3	10 Acres	☐ Non-Wet Areas:	yd^3	Acres

b. Fill Areas

☐ Vegetated Waterbottoms:	yd^3	Acres	☐ Wetlands:	yd^3	Acres
☐ Non-Vegetated Waterbottoms:	yd^3	Acres	☒ Non-Wet Areas:	20,000 yd^3	19 Acres

c. Fill Materials

☐ Concrete:	yd^3	☐ Rock:	yd^3
☐ Crushed Stone or Gravel:	yd^3	☐ Sand:	yd^3
☒ Native Material:	20,000 yd^3	☐ Topsoil/Dirt:	yd^3

☐ Other: yd^3

d. *What equipment will be used for the proposed project?*

☐ Airboat	☐ Bulldozer/Grader	☐ Marsh Buggy
☐ Backhoe	☒ Dragline/Excavator	☐ Other Tracked or Wheeled Vehicles
☐ Barge Mounted Bucket Dredge	☐ Handjet	☐ Self Propelled Pipe Laying Barge
☐ Barge Mounted Drilling Rig	☐ Land Based Drilling Rig	☐ Tugboat
☐ Other:		

Step 11 of 15 - Project Alternatives

a. *What alternative locations, methods, and access routes were considered to avoid impact to wetlands and/or waterbottoms?*

N/A

b. *What efforts were made to minimize impact to wetlands and/or waterbottoms?*

N/A

Step 12 of 15 - Permit Type and Owners

a. *Are you applying for a Coastal Use Permit?*

☐ **No** ☒ **Yes**

b. *Are you the sole landowner/oyster lease holder?*

☒ **No** ☐ **Yes**

☐ **The applicant is an owner of the property on which the proposed described activity is to occur.**

☐ **The applicant has made reasonable effort to determine the identity and current address of the owner(s) of the land on which the proposed described activity is to occur, which included, a search of the public records of the parish in which the proposed activity is to occur.**

☒ **The applicant hereby attests that a copy of the application has been distributed to the following landowners/oyster lease holders.**

Landowner/Oyster Lease Holders 1: Raceland Raw Sugars
Mailing Address: 159 Milli Street
City/State/Zip: Raceland LA 70394

Landowner/Oyster Lease Holders 2: John Barker

Mailing Address: 122 Barker Road
City/State/Zip: Lockport LA 70374

c. Does the proposed activity present potential impacts to vegetated wetlands?

☒ No ☐ Yes ☐ Not Sure

Step 13 of 15 - Maps and Drawing Instructions

111126477 - APPLICATION PLATS REVISIONS - APPLICATION FORM	**07/16/2007 01:23:04 PM**
111126577 - APPLICATION PLATS REVISIONS - PLATS	**07/16/2007 01:23:06 PM**
111126588 - APPLICATION PLATS REVISIONS - COVER LETTER	**07/16/2007 01:23:08 PM**

Step 14 of 15 - Payment

The fee for this permit is: $100.00

Step 15 of 15 - Payment Processed

Applicant Information

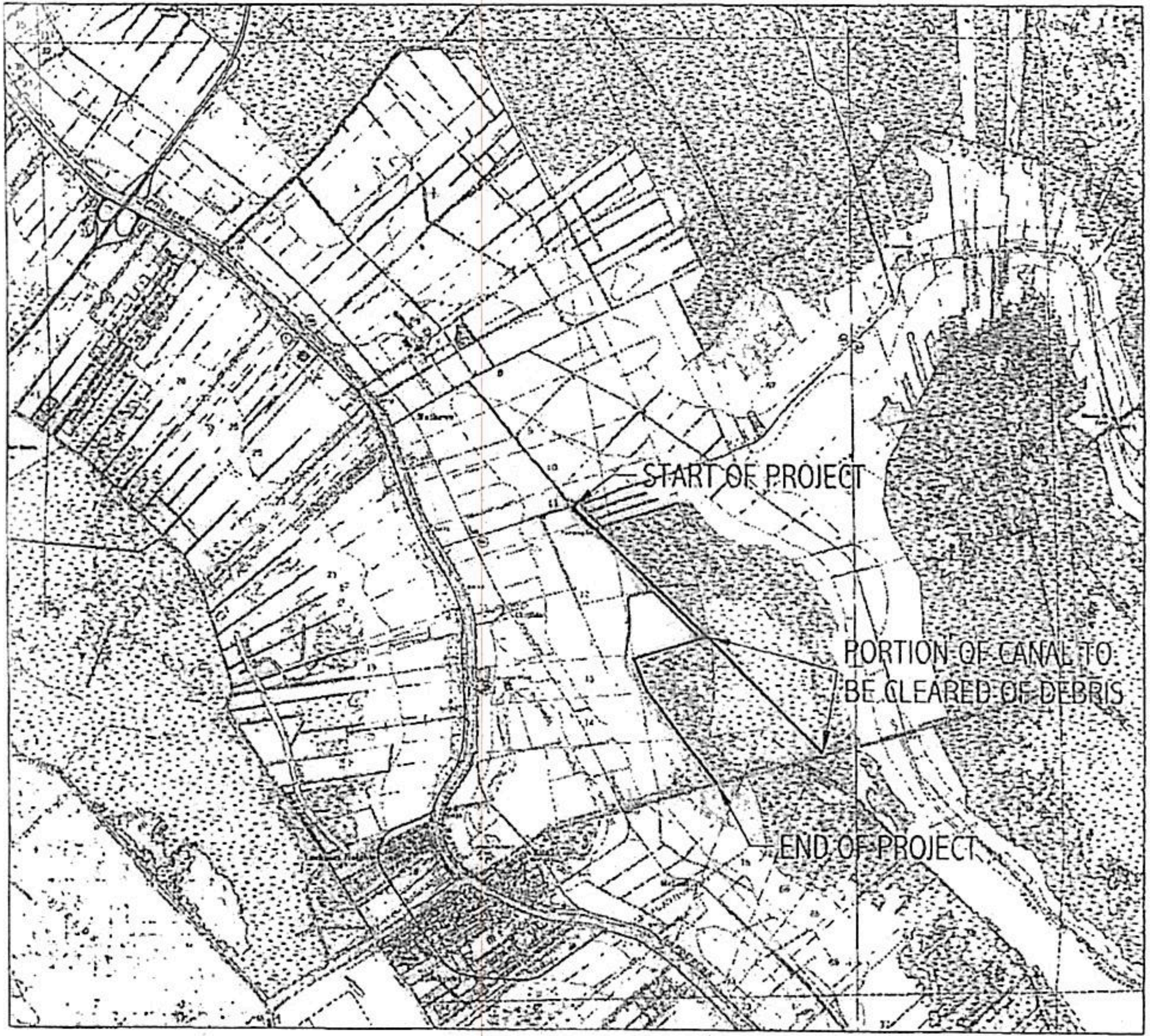
Applicant Name: Lafourche Parish Council
Address: P.O Drawer 5528
City/State/Zip: Thibodaux, LA 70302

Application Information

Permit Type: CUP

To the best of my knowledge the proposed activity described in this permit application complies with, and will be conducted in a manner that is consistent with, the Louisiana Coastal Management Program.

View Comments related to this project



START OF PROJECT
LAT. 29° 31' 41"
LONG. 90° 40' 52"

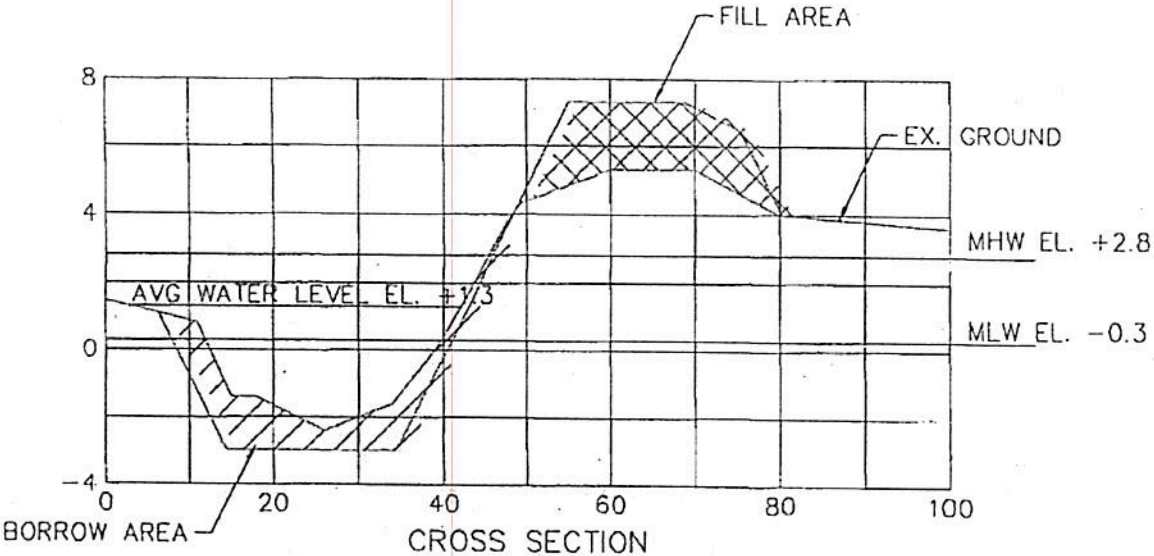
END OF PROJECT
LAT. 29° 39' 22"
LONG. 90° 30' 52"

PROJECT IS IN
SECTIONS: 11, 12, 13, 14, 15
T-16-S, R-19-E

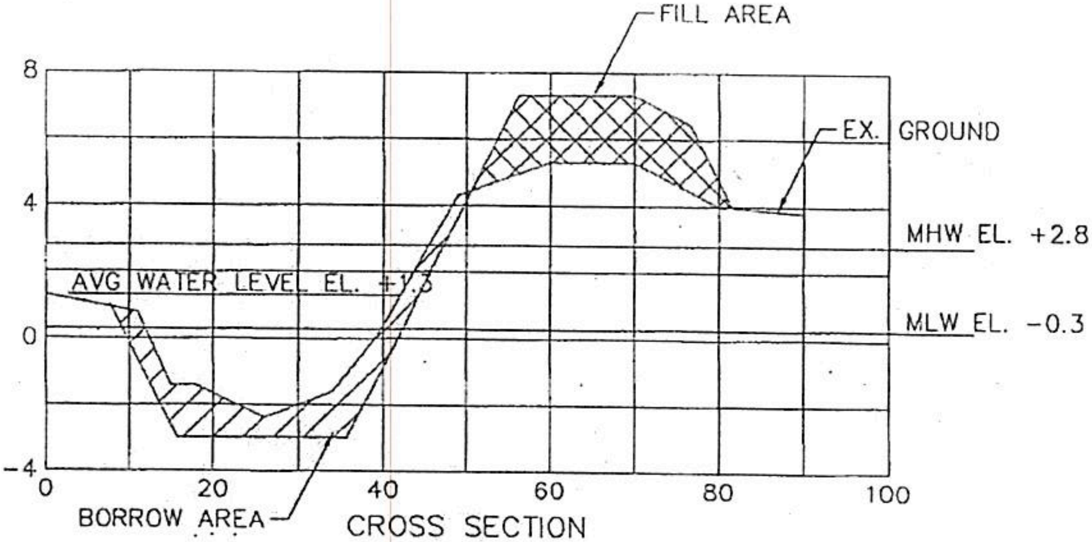
SHEET 1 OF 1

LAFOURCHE PARISH COUNCIL
PERMIT APPLICATION
TO CLEAN OUT THE MATHEWS CANAL
VICINITY MAP
DATE: MARCH, 2007 SCALE: 1" = 5000'

J. WAYNE PLAISANCE, INC.
CIVIL ENGINEERS & LAND SURVEYORS
P. O. DRAWER 730, GALLIANO, LA 70354
ph. (985)632-5596, fax (985)632-5628
JPlaisance@JWaynePlaisance.com



CROSS SECTION
SECTION 1



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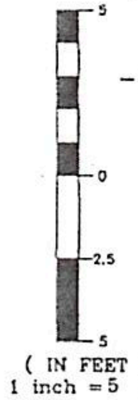
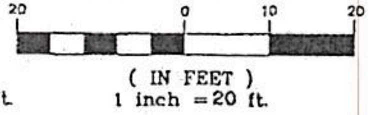


GRAPHIC SCALES

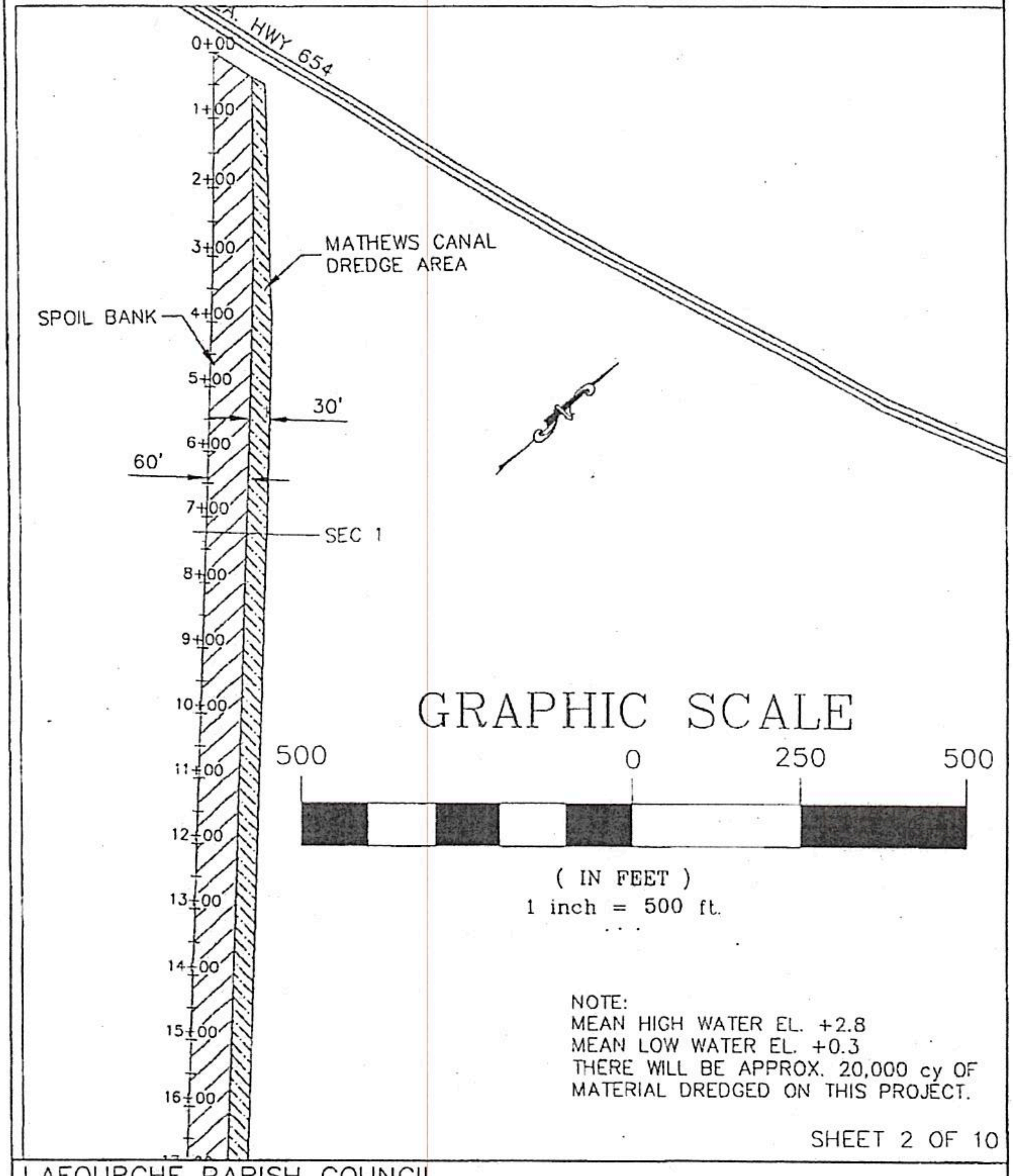


NOTE:
MEAN HIGH WATER EL. +2.8
MEAN LOW WATER EL. +0.3
THERE WILL BE APPROX. 20,000 cy OF MATERIAL DREDGED ON THIS PROJECT.

SHEET 9 OF 10

LAFOURCHE PARISH COUNCIL
PERMIT APPLICATION
TO CLEAN OUT THE MATHEWS CANAL
CROSS SECTION VIEW
DATE: MARCH, 2007 SCALE: 1" = 20. 1"=5"

J. WAYNE PLAISANCE, INC.
CIVIL ENGINEERS & LAND SURVEYORS
P. O. DRAWER 730, GALLIANO, LA 70354
ph. (985)632-5596, fax (985)632-5628
JPlaisance@JWaynePlaisance.com

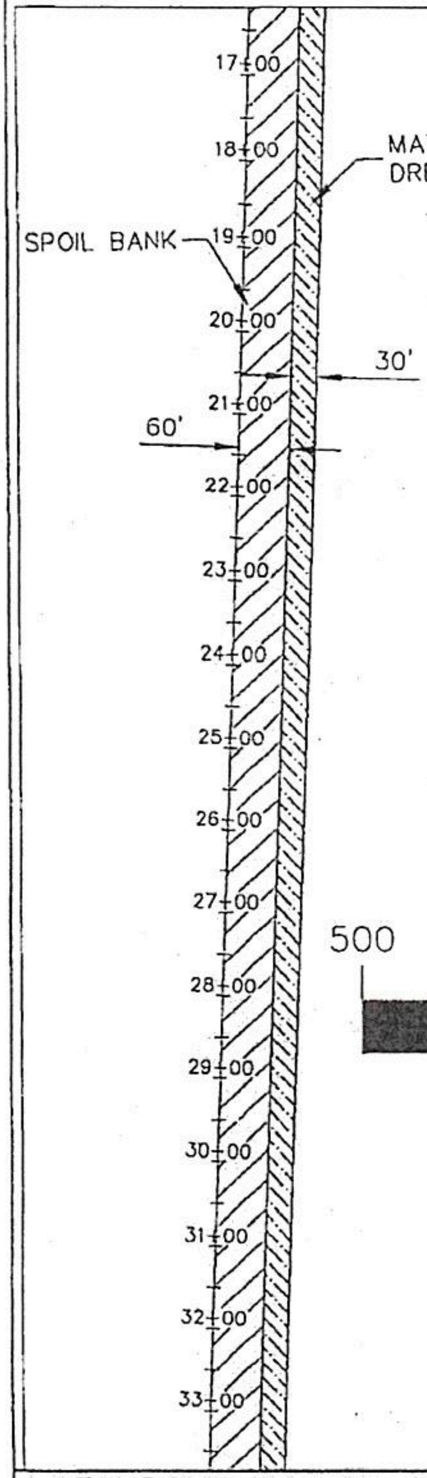


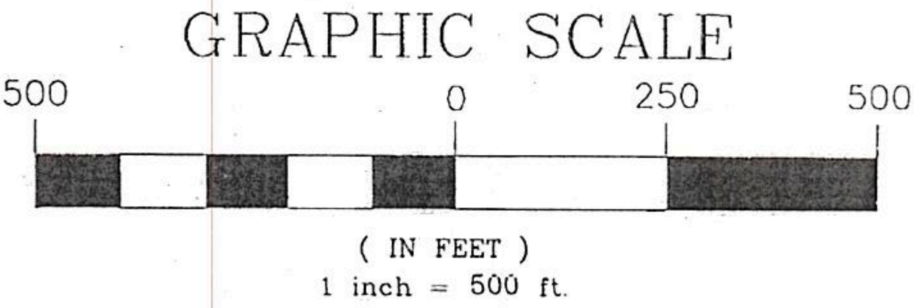
NOTE:
MEAN HIGH WATER EL. +2.8
MEAN LOW WATER EL. +0.3
THERE WILL BE APPROX. 20,000 cy OF MATERIAL DREDGED ON THIS PROJECT.

SHEET 2 OF 10

LAFOURCHE PARISH COUNCIL
PERMIT APPLICATION
TO CLEAN OUT THE MATHEWS CANAL
PLAN VIEW
DATE: MARCH, 2007 SCALE: 1" = 500'

J. WAYNE PLAISANCE, INC.
CIVIL ENGINEERS & LAND SURVEYORS
P. O. DRAWER 730, GALLIANO, LA 70354
ph. (985)632-5596, fax (985)632-5628
JPlaisance@JWaynePlaisance.com





NOTE:
MEAN HIGH WATER EL. +2.8
MEAN LOW WATER EL. +0.3
THERE WILL BE APPROX. 20,000 cy OF MATERIAL DREDGED ON THIS PROJECT.

SHEET 3 OF 10

LAFOURCHE PARISH COUNCIL
PERMIT APPLICATION
TO CLEAN OUT THE MATHEWS CANAL
PLAN VIEW
DATE: MARCH, 2007 SCALE: 1" = 500'

J. WAYNE PLAISANCE, INC.
CIVIL ENGINEERS & LAND SURVEYORS
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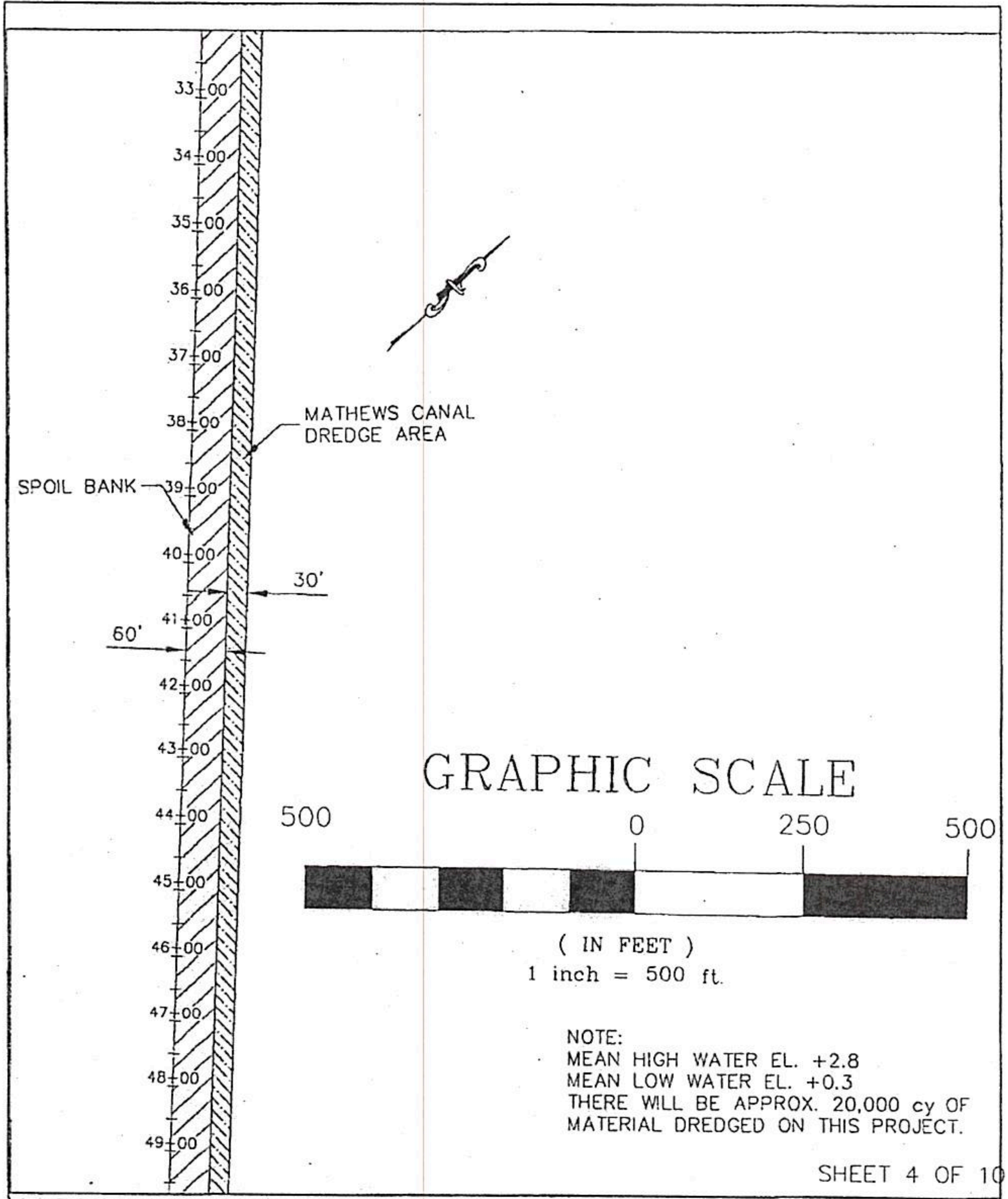

NOTE:
MEAN HIGH WATER EL. +2.8
MEAN LOW WATER EL. +0.3
THERE WILL BE APPROX. 20,000 cy OF
MATERIAL DREDGED ON THIS PROJECT.

SHEET 4 OF 10

LAFOURCHE PARISH COUNCIL
PERMIT APPLICATION
TO CLEAN OUT THE MATHEWS CANAL
PLAN VIEW
DATE: MARCH, 2007 SCALE: 1" = 500'

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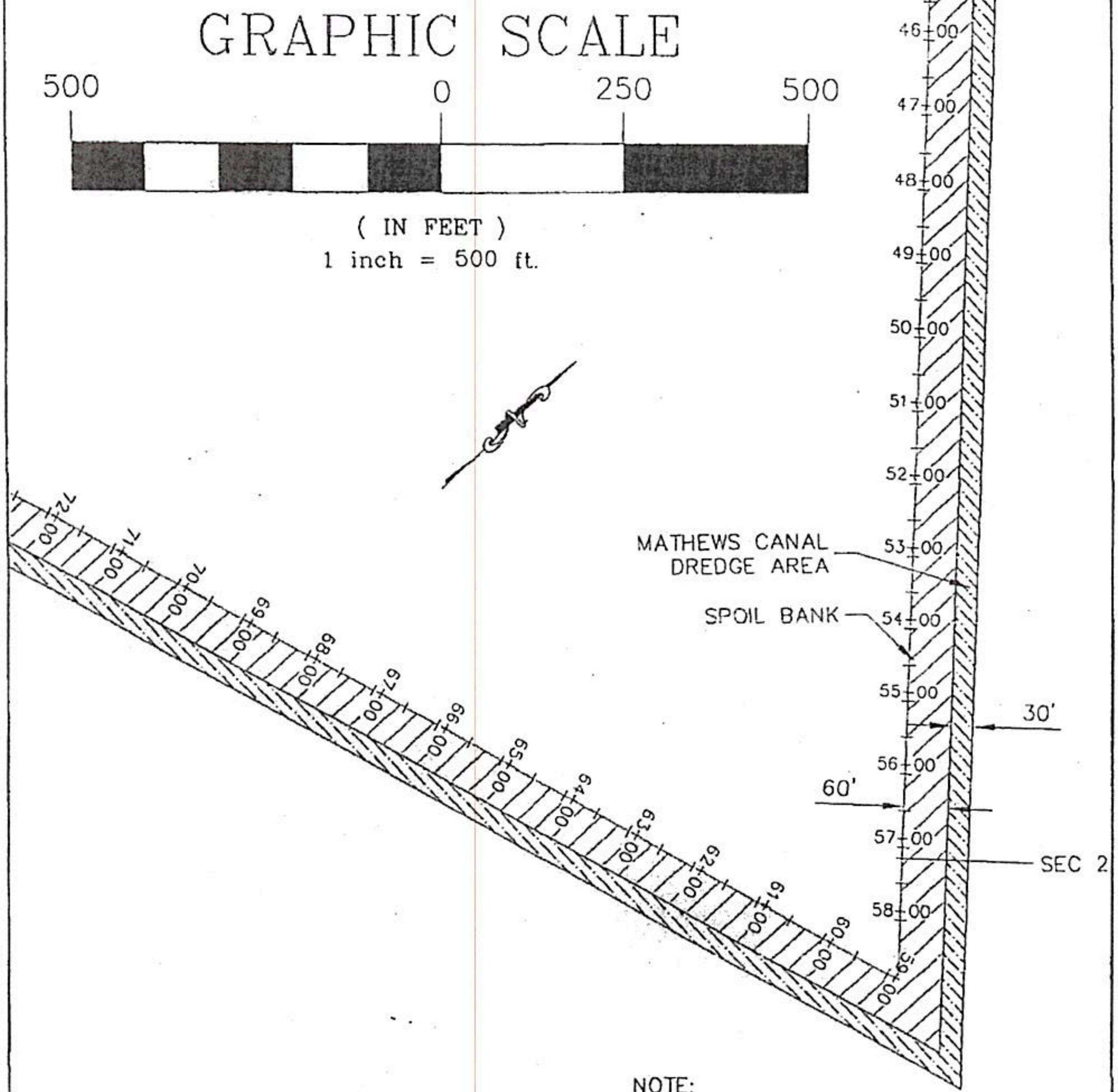
JPlaisance@JWaynePlaisance.com



NOTE:
MEAN HIGH WATER EL. +2.8
MEAN LOW WATER EL. +0.3
THERE WILL BE APPROX. 20,000 cy OF MATERIAL DREDGED ON THIS PROJECT.

SHEET 5 OF 10

LAFOURCHE PARISH COUNCIL
PERMIT APPLICATION
TO CLEAN OUT THE MATHEWS CANAL
PLAN VIEW
DATE: MARCH, 2007 SCALE: 1" = 500'

J. WAYNE PLAISANCE, INC.
CIVIL ENGINEERS & LAND SURVEYORS
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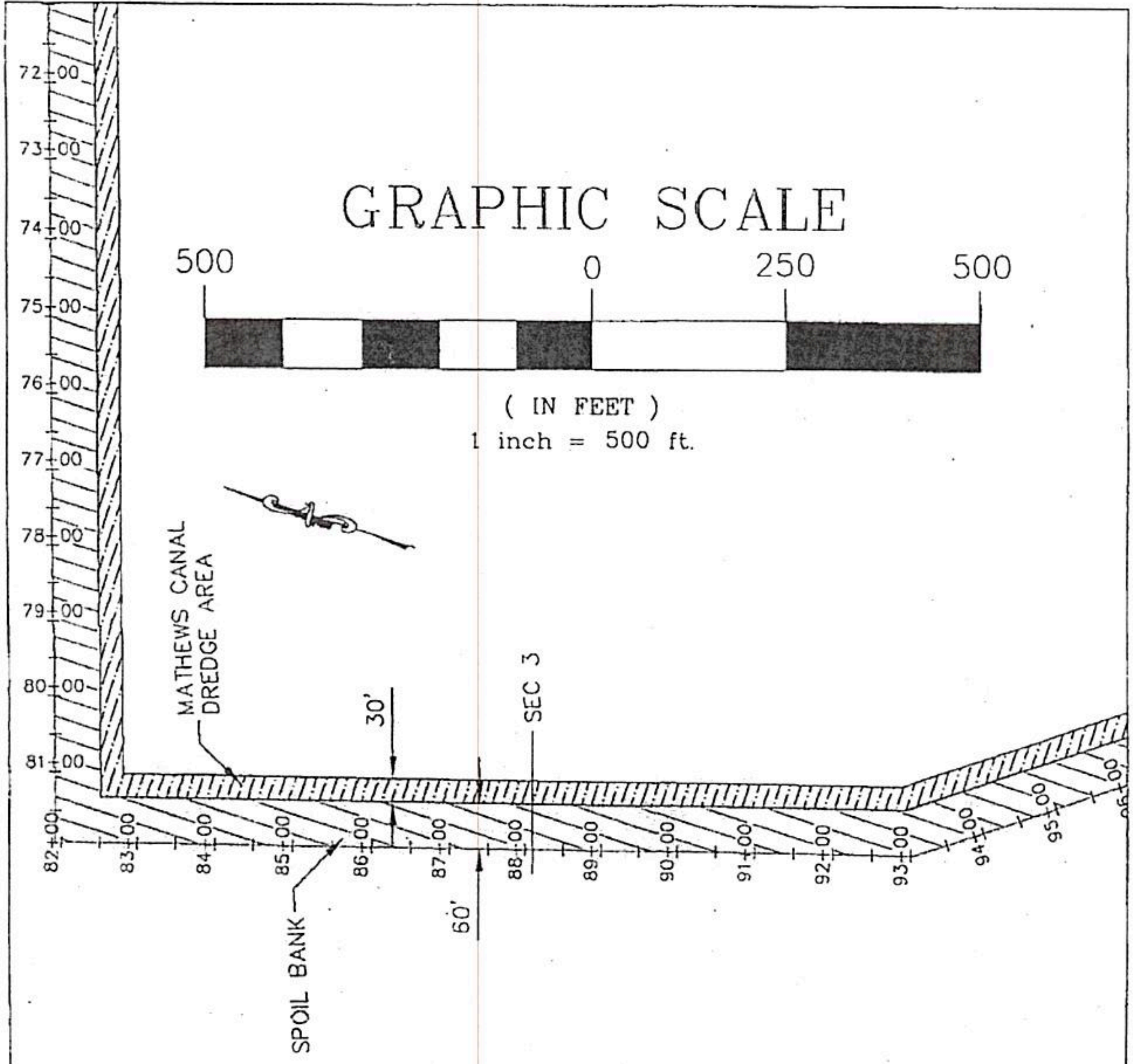
JPlaisance@JWaynePlaisance.com



NOTE:
MEAN HIGH WATER EL. +2.8
MEAN LOW WATER EL. +0.3
THERE WILL BE APPROX. 20,000 cy OF MATERIAL DREDGED ON THIS PROJECT.

SHEET 6 OF 10

LAFOURCHE PARISH COUNCIL
PERMIT APPLICATION
TO CLEAN OUT THE MATHEWS CANAL
PLAN VIEW
DATE: MARCH, 2007 SCALE: 1" = 500'

J. WAYNE PLAISANCE, INC.
CIVIL ENGINEERS & LAND SURVEYORS
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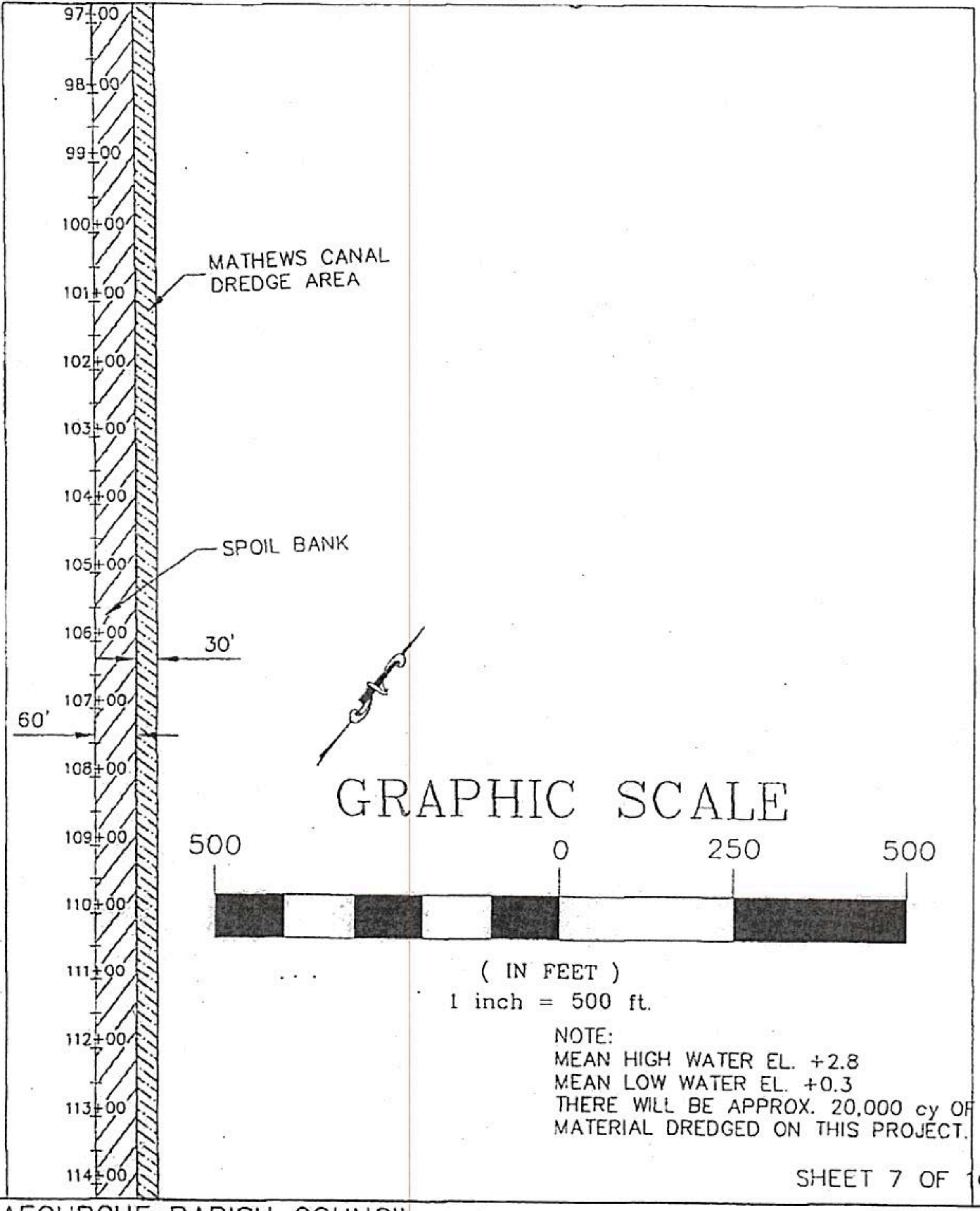
ph. (985)632-5596, fax (985)632-5628
JPlaisance@JWaynePlaisance.com



NOTE:
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MEAN LOW WATER EL. +0.3
THERE WILL BE APPROX. 20,000 cy OF MATERIAL DREDGED ON THIS PROJECT.

SHEET 7 OF 10

LAFOURCHE PARISH COUNCIL
PERMIT APPLICATION
TO CLEAN OUT THE MATHEWS CANAL
PLAN VIEW
DATE: MARCH, 2007 SCALE: 1" = 500'

J. WAYNE PLAISANCE, INC.
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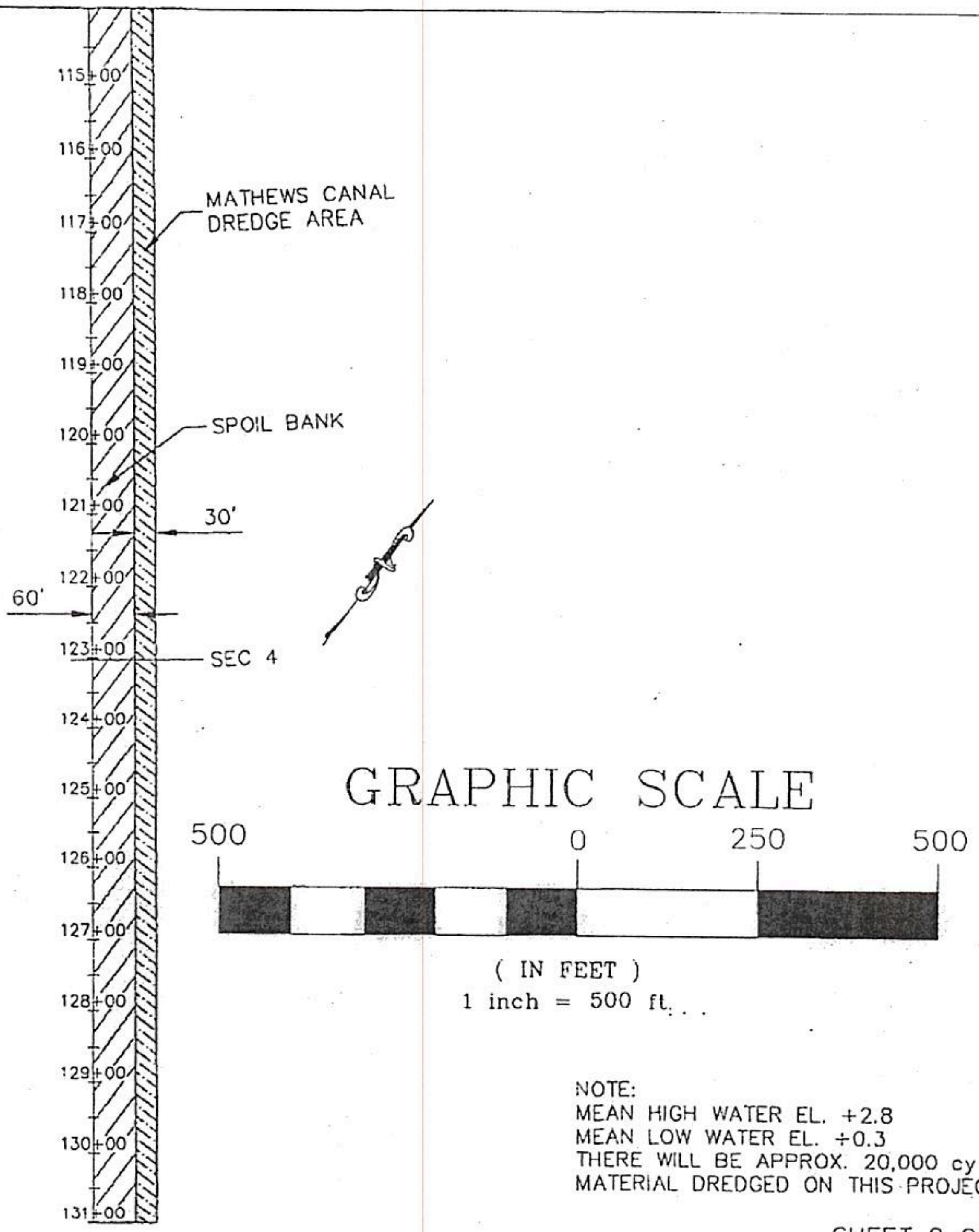

NOTE:
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MEAN LOW WATER EL. +0.3
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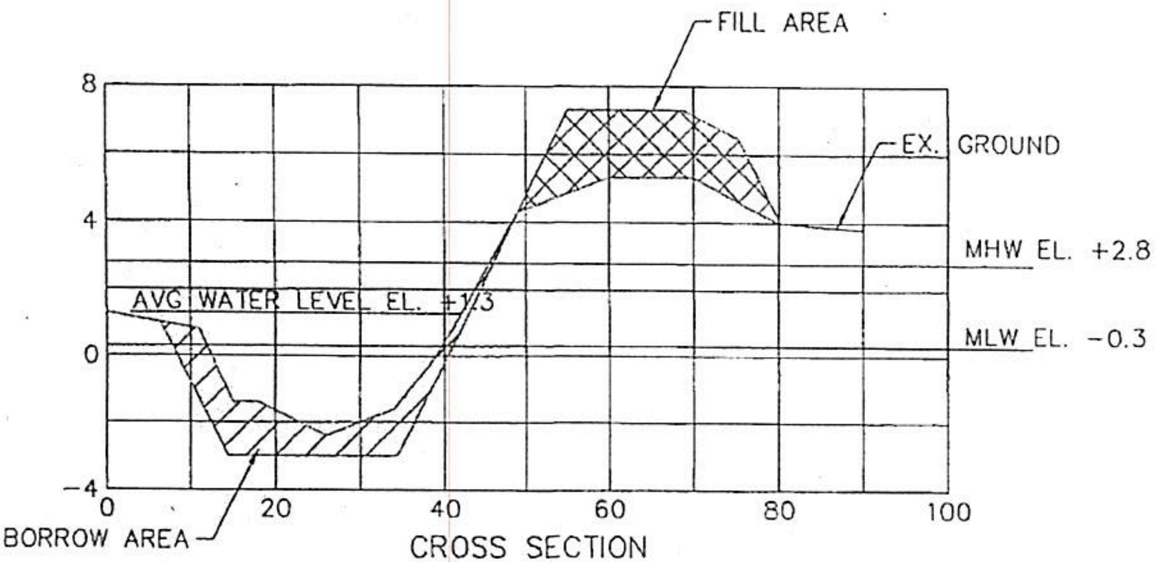
MATERIAL DREDGED ON THIS PROJECT.

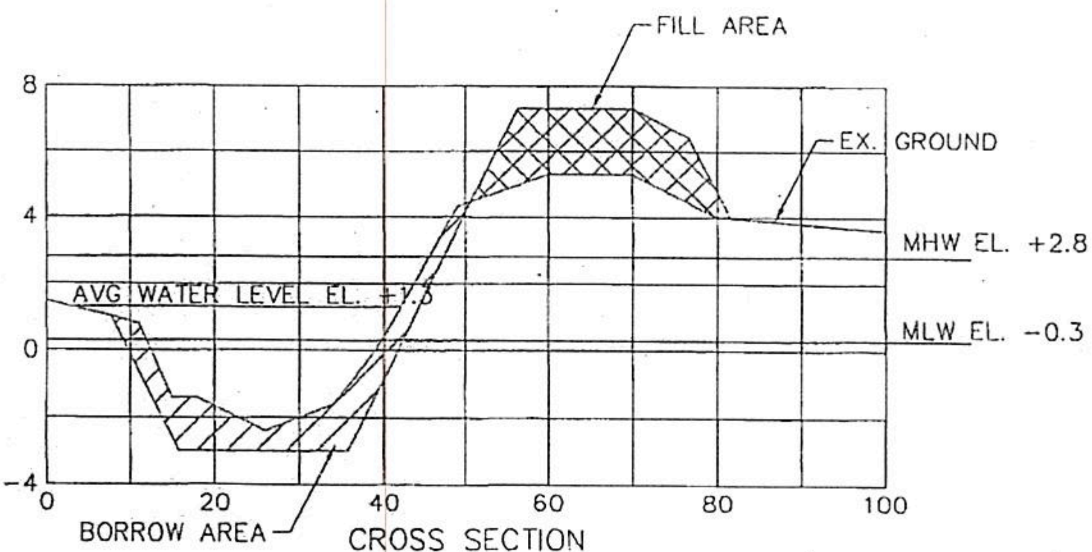
SHEET 8 OF 10

LAFOURCHE PARISH COUNCIL
PERMIT APPLICATION
TO CLEAN OUT THE MATHEWS CANAL
PLAN VIEW
DATE: MARCH, 2007 SCALE: 1" = 500'

J. WAYNE PLAISANCE, INC.
CIVIL ENGINEERS & LAND SURVEYORS
P. O. DRAWER 730, GALLIANO, LA 70354
ph. (985)632-5596, fax (985)632-5628
JPlaisance@JWaynePlaisance.com



CROSS SECTION
SECTION 3



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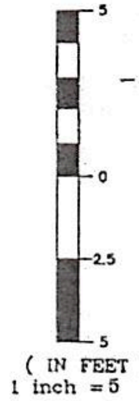
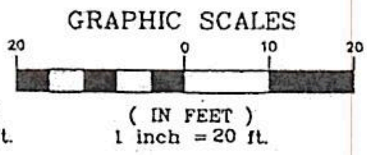
SECTION 4





NOTE:
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MEAN LOW WATER EL. +0.3
THERE WILL BE APPROX. 20,000 cy OF
MATERIAL DREDGED ON THIS PROJECT.

SHEET 10 OF 10

LAFOURCHE PARISH COUNCIL
PERMIT APPLICATION
TO CLEAN OUT THE MATHEWS CANAL
CROSS SECTION VIEW
DATE: MARCH, 2007 SCALE: 1" = 20, 1"=5"

J. WAYNE PLAISANCE, INC.
CIVIL ENGINEERS & LAND SURVEYORS
P. O. DRAWER 730, GALLIANO, LA 70354
ph. (985)632-5596, fax (985)632-5628
JPlaisance@JWaynePlaisance.com

Zeringue, Furcy J MVN

From: Herman, John M MVN
Sent: Tuesday, November 06, 2007 12:47 PM
To: Zeringue, Furcy J MVN
Subject: FW: Mathews Canal (MVN 2007-03969-CY)

Furcy, let me know what you need from me to facilitate S&E action.

Andre Uzee, David Poincon

Boudreau.

John M. Herman
U.S. Army Corps of Engineers
Central Evaluation Section
Phone: (504) 862-1581
Fax: (504) 862-2574/2117
john.herman@us.army.mil

-----Original Message-----
From: Herman, John M MVN
Sent: Tuesday, November 06, 2007 11:51 AM
To: 'Andre Uzee'
Cc: Zeringue, Furcy J MVN
Subject: RE: Mathews Canal (MVN 2007-03969-CY)

Andre,

This project has unauthorized activities involved and will need to go through our Surveillance and Enforcement Section for further processing. Furcy Zeringue will handle the unauthorized work and his number is (504) 862-2099. Also, I spoke with him about the other work (i.e., ditch maintenance and relocation) that is occurring on the sugar cane field side. He said that was OK since it is within a pumped system on active agricultural land and is considered ongoing maintenance.

In regard to the drawings, the plan view drawings need to reflect exactly what's out there - existing conditions. For example, your plan views should show the existing levee on the opposite side of Mathews Canal to include the cut grass/cattail along the fringe of the canal, the wetland area between the canal and existing levee, and the existing drainage ditch on the sugar cane field side.

Sheets 2-4 of the plan view drawings need to show the wetland area that was cleared between the canal and the levee. Also, sheets 3 & 4 need to show the dredge work that was done in the canal to include dimensions. You can also add this to your notes if necessary. One way to setup your drawings is to show the existing conditions on the top half of the page and show the proposed project on the bottom half of the page. If not, then enlarge drawing enough to show what is being proposed. If necessary, add any pertinent info to the note section for that page. The note sections font size on each page can be reduced in size. This will free up some space. Also, the plan views don't have to show so much property to the north and south sides of the property. We already know there's mostly swamp to the northeast and agricultural land to the west and southwest of the project. As such, you can show a little of each and label. This will also free up some additional space.

Sheet 5 of the plan view drawing needs to indicate what is to take place in Mathews Canal from point B southeastwardly to Company Canal (i.e., if no work is to take place, then indicate so on drawing). Also, sheet 5-9 notes should say that the work will be done from the existing levee from point B to C to D. Also, you may want to include a note that silt curtains will be placed along the levee to prevent runoff of unconsolidated fill material to enter adjacent wetlands. Once the newly placed dredged material stabilizes, then the silt curtains can be removed.

Sheet 6 of the plan view drawing I think needs to be flipped upside down.

Sheet 10 & 11 of the cross-section views should be labeled as a typical plan views for

GOVERNMENT EXHIBIT 133

Points A to B and Points B to C to D. Also, the cross-sections need to reflect existing conditions as indicated above. That is, they need to show the opposite side of the levee across Mathews Cnl to include the cutgrass along the sides for point A to B, and swamp for points B to C to D. Point A to B cross-section needs to show levee and berm that is to be reconstructed to include existing drainage ditch. Points B to C to C need to reflect existing conditions. For both cross-sections, you might want to decrease your horizontal scale from 10-foot blocks to 5-foot blocks so the profile doesn't appear too steep. Actual on site conditions are not that drastic. Also, be sure to label everything.

Would the LPG like to fill in the area between the canal and levee from point A to B and mitigate for the impacts (approx. 4 acres or so impact)? This way they will always have unimpeded access to Mathews Canal for future maintenance dredging.

Should you have any questions about the drawings, please feel free to contact me. If you have questions about the unauthorized work, call Furcy at the above number.

Thanks,

John M. Herman
U.S. Army Corps of Engineers
Central Evaluation Section
Phone: (504) 862-1581
Fax: (504) 862-2574/2117
john.herman@us.army.mil

-----Original Message-----
From: Andre Uzee [mailto:AUzee@JWaynePlaisance.com]
Sent: Tuesday, November 06, 2007 9:40 AM
To: Herman, John M MVN
Subject:

John- please review a draft copy of the Mathews canal drawing and let me know if you need some additional information. I found a couple of revisions I need to make but would like your input.

Thanks,

Andre Uzee

auzee@jwayneplaisance.com

J. Wayne Plaisance INC.

P.O. drawer 730

Galliano, La.70345

Ph. (985) 632-5596

Fax (985) 632-5628

MVN 2007-02926
Oct 11. 2007-

Zeringue, Furcy J MVN

From: Herman, John M MVN
Sent: Monday, October 15, 2007 11:51 AM
To: Zeringue, Furcy J MVN
Subject: Unauthorized activities for Laf Ph Gov't

Attachments: MathewsCnl (17).JPG; MathewsCnl.JPG; MathewsCnl (1).JPG; MathewsCnl (2).JPG; MathewsCnl (3).JPG; MathewsCnl (4).JPG; MathewsCnl (5).JPG; MathewsCnl (6).JPG; MathewsCnl (7).JPG; MathewsCnl (8).JPG; MathewsCnl (9).JPG; MathewsCnl (10).JPG; MathewsCnl (11).JPG; MathewsCnl (12).JPG; MathewsCnl (13).JPG; MathewsCnl (14).JPG; MathewsCnl (15).JPG; MathewsCnl (16).JPG

MathewsCnl (17).JPG (300 KB)
MathewsCnl.JPG (138 KB)
MathewsCnl (1).JPG (122 KB)
MathewsCnl (2).JPG (203 KB)
MathewsCnl (3).JPG (190 KB)
MathewsCnl (4).JPG (250 KB)
MathewsCnl (5).JPG (186 KB)
MathewsCnl (6).JPG (224 KB)
MathewsCnl (7).JPG (251 KB)
MathewsCnl (8).JPG (205 KB)
MathewsCnl (9).JPG (158 KB)
MathewsCnl (10).JPG (240 KB)
MathewsCnl (11).JPG (178 KB)
MathewsCnl (12).JPG (290 KB)
MathewsCnl (13).JPG (271 KB)
MathewsCnl (14).JPG (243 KB)
MathewsCnl (15).JPG (246 KB)
MathewsCnl (16).JPG (251 KB)

Furcy, please get with me when you get in. I have some matters we need to discuss regarding the subject pictures.

photos 2, 11, 12, 13, 14, 15, 14. show the violation.

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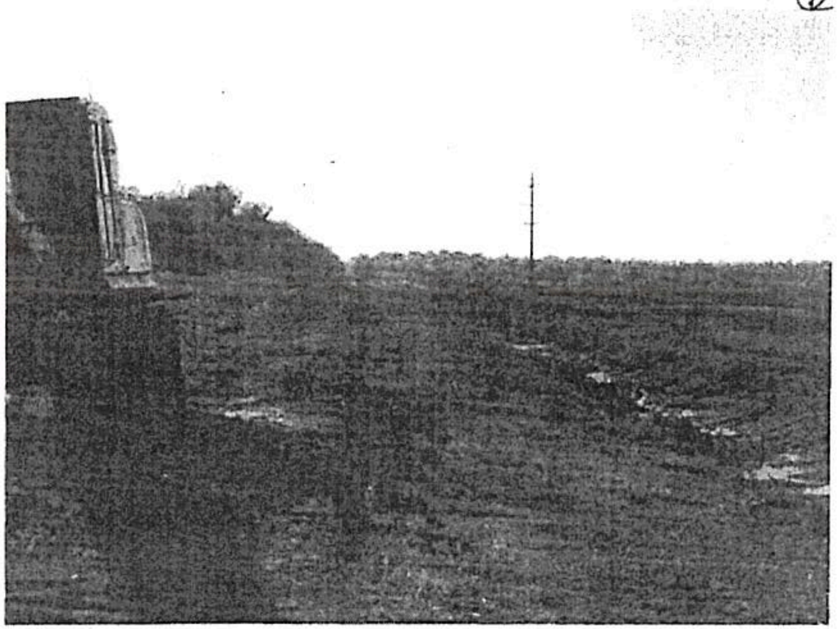
①



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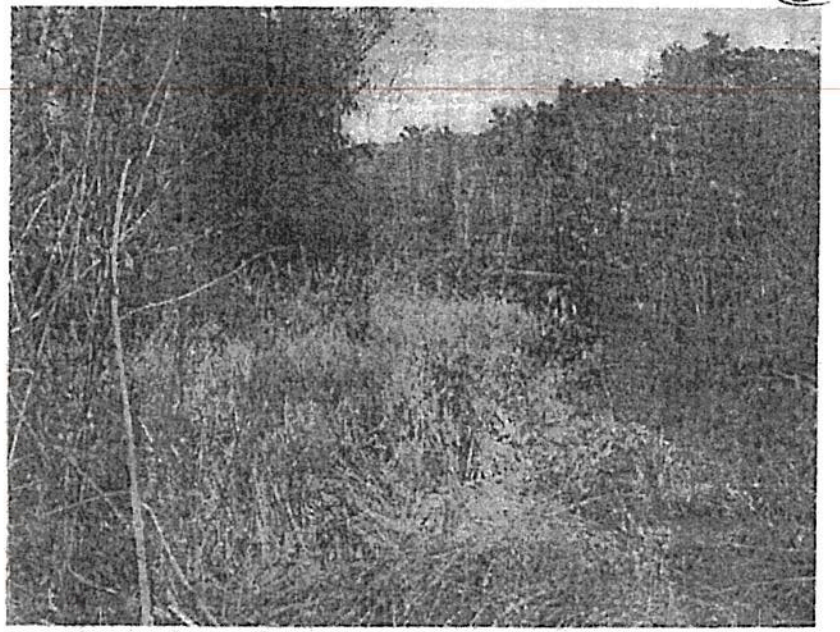

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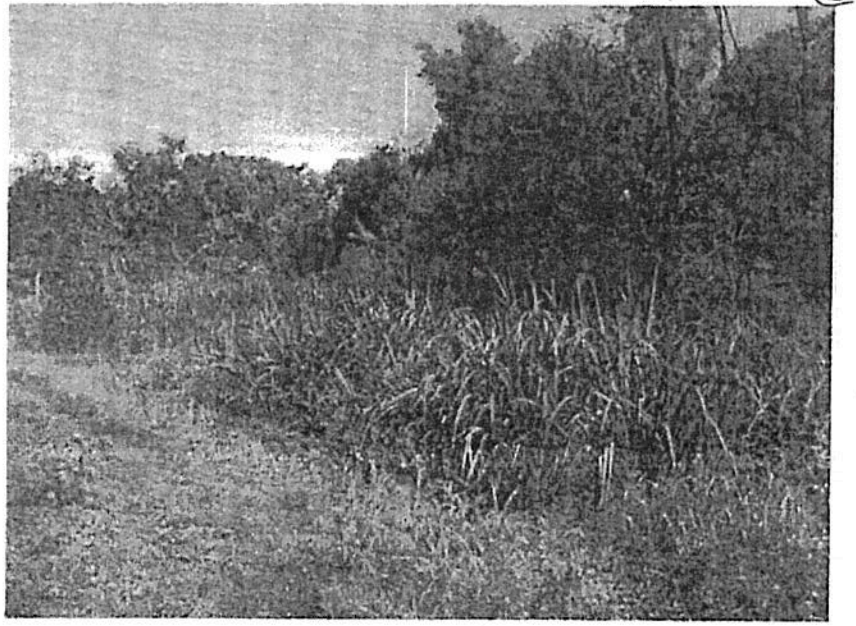

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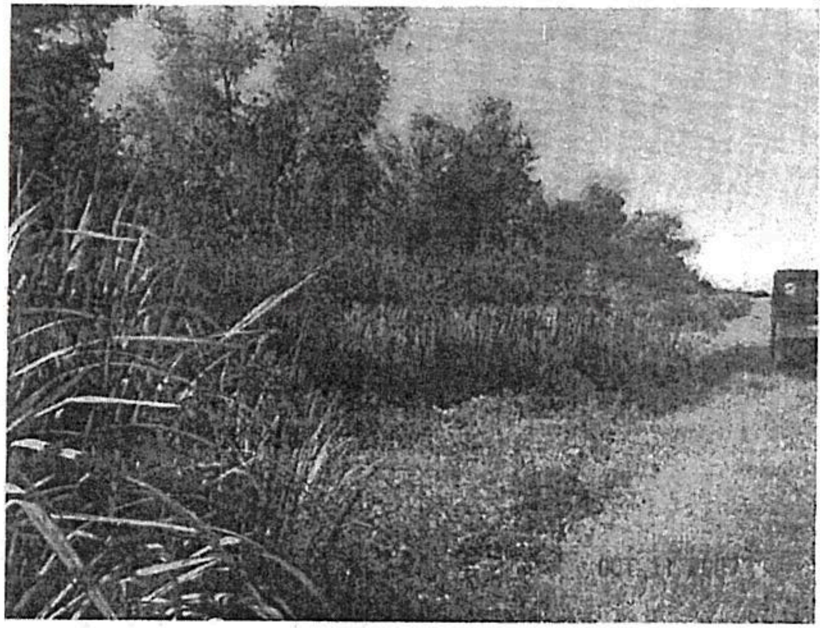

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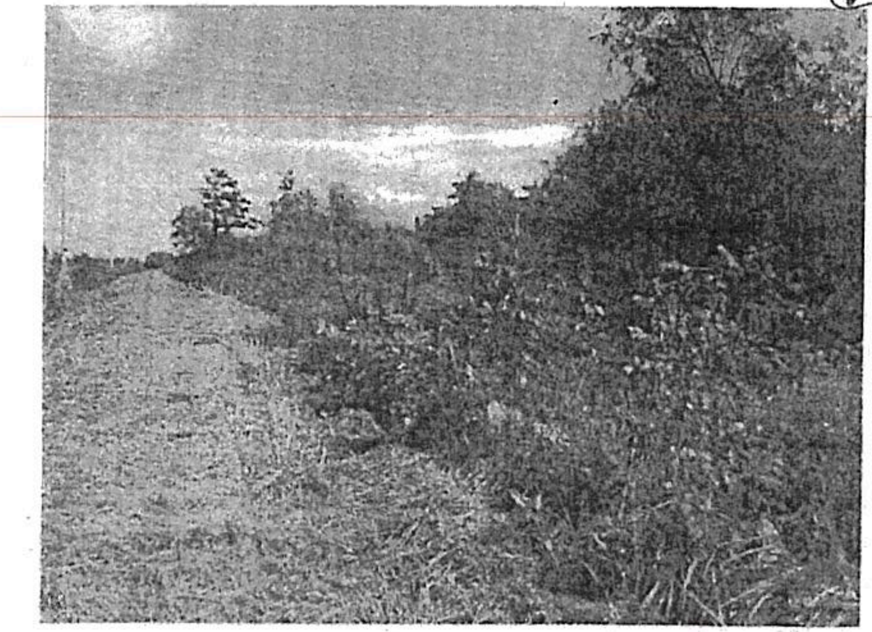

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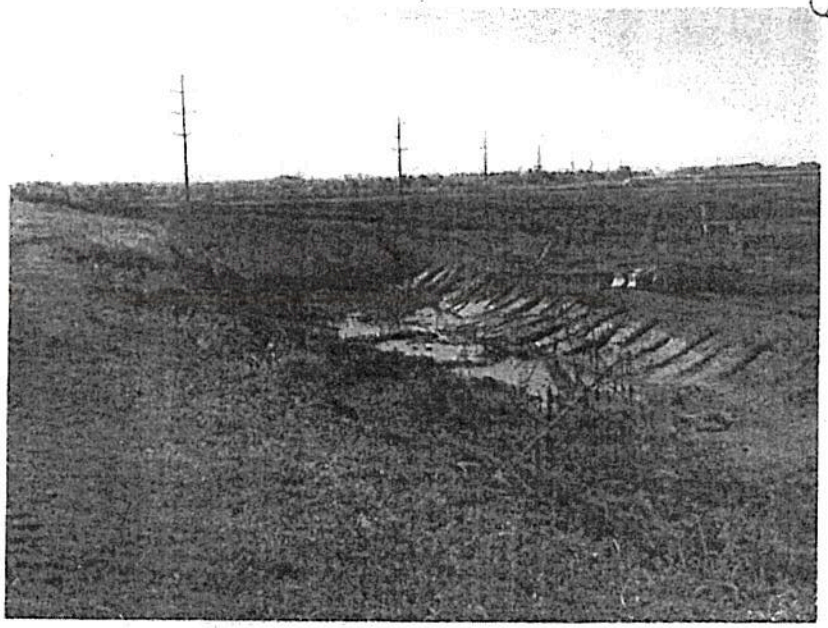

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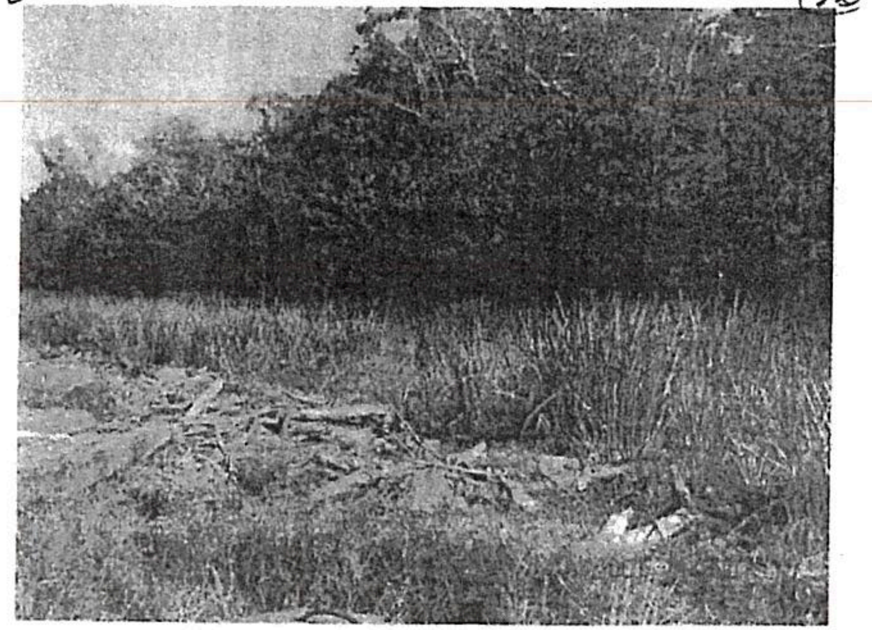

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LAFOURCHE PARISH PENALTY CALCULATION- JUNE 23, 2008

MATHEWS CANAL

On December 1, 2004, EPA issued an Administrative Order (CWA-06-2004-2703) to Lafourche Parish for four levees that were built without a permit and without considering the least damaging practical alternative. The Order required that Lafourche Parish apply for an after-the-fact permit. In the interim, it required that Lafourche Parish construct gaps in the levees as specified by a map. To date, Lafourche Parish has put in gaps at locations agreed to by the COE and EPA. Lafourche Parish has submitted an after-the-fact permit application to the COE.

On March 3, 2006, the COE inspected a new site and observed unauthorized mechanical landclearing and deposition of dredged material relative to the construction of a drainage canal (620 feet) and clearing of 8.65 acres of forested wetlands on the property boundary common to Mr. Harris Theriot and Mr. Timothy Acosta. The COE issued a Cease and Desist Order to Lafourche Parish on May 8, 2006. Lafourche Parish provided written response back to the Cease and Desist on January 10, 2007. On August 20, 2007, EPA issued an administrative complaint with a proposed penalty of $40,000.00.

On October 11, 2007, The COE inspected the Mathew Canal Site and observed unauthorized mechanical landclearing of 2-3 acres of jurisdictional forested wetlands.

1. ECONOMIC BENEFIT- None assessed.

GRAVITY-

Multiplier- $500.00- because they are local government

A Factors-
Harm to Human Health or Welfare- 0
Extent of Aquatic Env Impact- 0
Severity of Impacts to Aquatic Env- 0
Unique Sensitivity of Affected Resources- 0
Secondary or Off-Site Impacts-0
Duration of Violation- 0

B Factors-
Degree of Culpability- 20- Lafourche Parish had prior knowledge of the Section 404 Program and they had knowledge that they needed a 404 Permit before they constructed the drainage ditch.
Compliance History the Violator- 20- Lafourche Parish has a prior history of prior 404 violations. EPA issued an Administrative Order to Lafourche Parish on December 1, 2004. Also, EPA issued an Administrative Complaint on August 20, 2007.

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Need for Deterrence- 20- Lafourche Parish needs to be sent a specific deterrence message because the violations have been repeated.

2. PRELIMINARY GRAVITY- 60 X 500= $30,000.00

3. ADJUSTMENTS TO GRAVITY
a. Recalcitrance- 0

b.Quick Settlement- 0

c. Other Factors as Justice May Require-0

d. Final Adjustments-0

4. PRELIMINARY PENALTY- 30,000.00

Litigation Considerations-0

Inability to Pay-0

Penalty Settlement Bottom Line- $30,000.00

Proposed Penalty- $30,000.00

Draft - For Attorney Review - Do Not Release Mathews Coal

PENALTY CALCULATION FOR xxx 404 VIOLATION

STEP	No Action					Notes
1. ECONOMIC BENEFIT						
Use BEN to calculate econ. benefit =						
GRAVITY						
Set **Multiplier** (500/1,500/3k - 10k)	500					
A Factors (Scale 0-20)						
Harm to Human Health or Welfare	—					
Extent of Aquatic Env Impact	—					
Severity of Impacts to Aquatic Env	—					
Unique/Severity of Affected Resource	—					
Secondary or Off-Site Impacts	—					
Duration of Violation	—					
B Factors (0-20)						
Degree of Culpability	20					
Compliance History of the Violator	20					
Need for Deterrence	20					
2. Preliminary Gravity (A + B) x M	30,000					
3. ADJUSTMENTS TO GRAVITY						
a. Recalcitrance (+ 0 - 200%)	—					
b. Quick Settlement (-10%)	-10%	-10%	-10%	-10%)		
c. Other Factors As Justice May Require	—					
d. FINAL ADJUSTMENTS (3a+3b+3c)						
4. PRELIMINARY PENALTY (1+2+3d)	30,000					
Litigation Considerations (-10%)	—					
Inability to Pay	—					
Penalty Settlement Bottom-Line						
Proposed Penalty (To start negotiations)	30,000					

SEP EVALUATION

Step 1: (Settlement without SEP)					
Step 2: > of (10%G + EB) or (25%G)					
Step 3: SEP cost					
Step 4: SEP % applied to penalty					
Step 5: Final Settlement Penalty					

CONFIDENTIAL- FOR ATTORNEY REVIEW

WETLANDS ENFORCEMENT SUMMARY

Lafourche Parish Case (updated 06/10/2008)

SITE: There are 2 sites that are the subject of this amended complaint. The first site consists of construction of a drainage canal (620 feet long) and the clearing of 8.65 acres of forested jurisdictional wetlands located in Section 19, Township 15 South, Range 17 East, Lafourche Parish, Louisiana. The second site consists of mechanized land clearing of 2-3 acres of forested jurisdictional wetlands located in Sections 11 and 12, Township 16 South, Range 19 East, Lafourche Parish, Louisiana.

IMPACT: The first site concerns the unauthorized discharge of fill material while constructing a drainage canal and the land clearing and/or leveling of forested wetlands. This drainage canal flows into Bayou Cutoff, a traditional navigable waterway. The second site concerns the unauthorized discharge of fill material while land clearing a forested wetland. This wetland flows into Mathews Canal, a tidal water body.

BACKGROUND: On August 8, 2001, the COE received a citizen tip that the Lafourche Parish Government was building an unauthorized levee at the St. James Canal. The COE contacted Mr. Gerald. Breaux, Parish President. Mr. Breaux stated that the work was in the planning stage, that no work had begun, and that they had been in contact with the COE permit people. On September 20, 2001 the COE received another anonymous tip that the Lafourche Parish was uplifting 2 levees near Greens, using equipment and manpower of Lafourche Basin Levee District. Mr. Breaux was again contacted and he had checked and discovered that the Parish had built levees in preparation for Hurricane Allison. The Parish sent after-the-fact permit applications for all the levees that had been already constructed. The COE found the Parish had built levees: a) without a permit, b) applied for but not permitted, c) permitted, but built off the permitted route, d) permitted but constructed after the permit expired. On March 2, 2002, the COE referred the case to EPA. On August 18, 2004, EPA issued an Administrative Order to Lafourche Parish requiring restoration of 3 levees and the permitting for 1 levee. The EPA issued an amended Administrative Order on December 1, 2004 allowing Lafourche Parish to apply for an after-the-fact permit for all the levees. They were also required as an interim measure to construct gaps in the levees at locations agreed upon by EPA and the COE. To date, Lafourche Parish has put in all the gaps and they have submitted an after-the-fact permit application for all the levees. The Administrative Order is still open pending completion of the permitting process. On March 3, 2006, the COE inspected a new Lafourche Parish Site. This site was referred to EPA. On August 20, 2007, EPA issued an Administrative Complaint with a proposed penalty of $40,000.00. On October 11, 2007, the COE inspected another Lafourche

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Parish Site. This site was also referred to EPA.

AGENCY ACTION:

August 8, 2001- A citizen phoned the COE stating that the Lafourche Parish was about to begin work "at the end of Choctaw Road". Mr. Breaux, Parish President was contacted and questioned. He stated that the Parish was contemplating such a levee and would coordinate with the COE permit people

September 19, 2001- Information was again received by a citizen that the Parish was uplifting 2 levees near Greens, using equipment and manpower of Lafourche Basin Levee District.

September 19-21, 2001- Efforts to contact both parties proved futile.

September 20, 2001- Two after-the-fact permits applications were received from the Parish for levees in the Chackbay area.

September 25, 2001- Mr. Breaux phoned in response to the COE's numerous calls to his office. He stated, in part, the following:

a) All work had been stopped at the Gheens site.

b) When confronted with the 2 after-the-fact applications, he said that when they last spoke, they had talked about emergency permitting. After the call, he thought of the subject sites and submitted the after-the-fact permit applications. A verbal Cease and Desist Order was issued.

October, 2001-A written Cease and Desist Order was issued.

October 3, 2001- The COE and Lafourche Parish inspected the alleged violations north of Highway 304 and portions of the levees south of Highway 304.

October 23, 2001-The COE and Lafourche Parish inspected the remaining levee violations north of Highway 304.

October 24, 2001- The COE received a phone call from a citizen alleging that the Lafourche Levee Basin District was performing levee work for the Parish.

October 24, 2001- The Lafourche Basin District was contacted and they stated that they were to commence work tomorrow on a levee for the Parish.

October 24, 2001-Mr. Breaux was contacted and confirmed that they were preparing to commence work in a pasture. The COE explained that the Parish should be requesting jurisdictional determinations from the COE prior to beginning any work in possible wetlands.

November 7, 2001- The COE phoned Mr. Breaux and explained that he should check records of equipment and budget to determine if any other work was performed within the last five years that the COE should look at now so all past work could be resolved at the same time.

March, 2002-The COE and the Parish discuss interim protection matters. The case is referred to EPA for enforcement.

July 3, 2003- EPA sends the Parish a notification letter informing them that the case had been referred to EPA.

October 22, 2003- The COE and EPA met with the Parish to discuss the violations and to inform them of the possible alternatives that might be considered for settlement of the matter.

August 18, 2004- EPA issues an Administrative Order to the Respondent for restoration of Levees B-D and submittal of an after-the-fact permit application for Levee A and Reed and Dean Toups Levee System.

November 11, 2004- EPA met with the COE to discuss locations for gaps that will have to be constructed.

December 1, 2004- EPA issued an Amended Administrative Order which required installation of gaps in the levees and the submittal of an after-the-fact permit application for the levees. Levees which are not permitted will be required to be restored.

March 23, 2005- The Parish submitted an after-the-fact application for all the levees to the COE and a copy was sent to EPA

April 8, 2005- The Parish sent a letter to EPA to inform us that the gaps had been installed in all of the locations specified by the COE and EPA.

June 9, 2005- EPA made a site visit to the Parish to view the gaps in the levees.

November 3, 2005- EPA sent comments to the COE concerning the permitting of all of the levees. EPA recommenced that a COE permit be denied for the activities as currently proposed.

March 3, 2006- The COE inspected a new site and observed unauthorized mechanical landclearing and deposition of dredged material relative to the construction of a drainage canal (620 feet long) and clearing of 8.65 acres of forested wetlands.

May 8, 2006- The COE issued a Cease and Desist to Lafourche Parish.

January 10, 2007- Lafourche Parish provided a written response back to the Cease and Desist.

August 20, 2007- EPA issued an Administrative Complaint with a proposed penalty of $40,000.00.

October 11, 2007- The COE inspects another new site and observed unauthorized mechanical landclearing of 2-3 acres of jurisdictional forested wetlands. Lafourche Parish had submitted to the COE a permit application for this site. Lafourche Parish had begun the work before acquiring their permit.

January 29, 2008- The COE refers the new site to EPA.

Strategy: Currently, EPA is waiting on the permitting process between the COE and the Parish for Administrative Order, Docket No. CWA-06-2004-2703. EPA has sent comments to the COE concerning the proposed permit. If the Parish is unable to obtain a permit/s, the areas that will not be permitted shall be restored to their natural hydrology and allowed to renegotiate naturally.

On August 20, 2007, EPA issued an Administrative Complaint for the second site that the COE referred. Since then the COE has found an additional site which was referred to EPA. It is recommended that EPA issue an Amended Complaint to cover both the second and third violations. Lafourche Parish is very aware of the Section 404 Program and these violations are very flagrant. The COE will handle the potential permits for these sites.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 Ross Avenue
Dallas, Texas 75202-2733

Action: Notice of Proposed Assessment of Clean Water Act Section 309(g) Class II Administrative Penalty and Opportunity to Comment

EPA is authorized under Section 309(g) of the Clean Water Act, 33 U.S.C. § 1319(g), to assess a civil penalty after providing the person subject to the penalty notice of the proposed penalty and the opportunity for a hearing, and after providing interested persons public notice of the proposed penalty and a reasonable opportunity to comment on its issuance. Under Section 309(g), any person who without authorization discharges a pollutant to a navigable water, as those terms are defined in Section 502 of the Act, 33 U.S.C. § 1362, may be administratively assessed a civil penalty of up to $137,500 by EPA. Class II proceedings for Section 309(g) of the Clean Water Act are conducted in accordance with the "Consolidated Rules of Practice Governing the Administrative Assessment of Civil Penalties, Issuance of Compliance or Corrective Action Orders, Revocation, Termination or Suspension of Permits", 64 Fed. Reg. 40138 (July 23, 1999)("Part 22"), including Rules related to Administrative Proceedings not Governed by § 554 of the Administrative Procedures Act, 40 C.F.R. §§ 22.50 - 22.52 (64 Fed. Reg. 40138, 40190). The Federal Register is available at most libraries.

The procedures by which the public may submit written comments on a proposed Class II penalty order or participate in a Class II penalty proceeding are set forth in Part 22. Any person wishing to comment on the proposed penalty order must submit written comments to the Hearing Clerk identified below within thirty (30) days after the issuance of this public notice.

Pursuant to Section 309(g)(4) of the Clean Water Act, 33 U.S.C. § 1319(g)(4), EPA is providing public notice of the following proposed Class II administrative penalty assessment:
Name and address of complainant:

Miguel I. Flores, Director
Water Quality Protection Division
U.S. EPA, Region 6
U.S. Environmental Protection Agency
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Name of respondent:

Lafourche Parish
P.O. 5548
Thibodaux, LA 70302

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Location of alleged violations: The first site is located at Section 19, Township 15 South, Range 17 East, Lafourche Parish, Louisiana. This involved the construction of 620 feet of a drainage canal and the clearing of 8.65 acres of forested, jurisdictional wetlands. The second site is located at Sections 11 and 12, Township 16 south, Range 19 East, Lafourche Parish, Louisiana. This involved the mechanized land clearing of 2-3 acres of forested jurisdictional wetlands.

Nature of alleged violations: Discharge of "dredged" and/or "fill material" to construct a drainage canal and the clearing of 8.65 acres of forested wetlands. The drainage ditch and cleared wetlands flow into Bayou Cutoff , a navigable water and waters of the U.S. Discharge of "dredged" and/or "fill" to clear 2-3 acres of forested wetlands adjacent to Mathews Canal, a tidal water body.

Proposed penalty: Up to $137,500

Name of Case: Lafourche Parish

Docket Number: CWA-06-2007-2725

Date filed with Regional Hearing Clerk: June 26, 2008

Mailing address, and telephone number of Regional Hearing Clerk:
Ms. Lorena Vaughn
Regional Hearing Clerk (6RC-HO)
U.S. Environmental Protection Agency, Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733
(214) 665-8021

FOR FURTHER INFORMATION: Persons wishing to receive a copy of Part 22, review the complaint or other documents filed by the parties in this proceeding, comment upon the proposed penalty assessment, or participate in any hearing that may be held, should contact the Regional Hearing Clerk identified above. Unless otherwise noted, the public record for the proceeding is located in the EPA Regional Office at 1445 Ross Avenue, Dallas, Texas 75202-2733, and the file will be open for public inspection during business hours. Persons wishing to receive information on the proceeding, may contact: Donna Mullins, Marine and Wetlands Section, U.S.

EPA, 1445 Ross Avenue, Dallas, Texas 75202-2733, (214) 665-7576.

In order to provide opportunity for public comment, EPA will not take final action in this proceeding prior to thirty (30) days after issuance of this notice.